Amateur Radio

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WIRELESS INSTITUTE OF AUSTRALIA

Horus high altitude balloons

- Icom ID-31A review
- WIA Annual Conference reports
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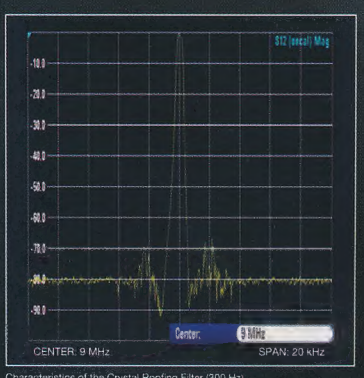

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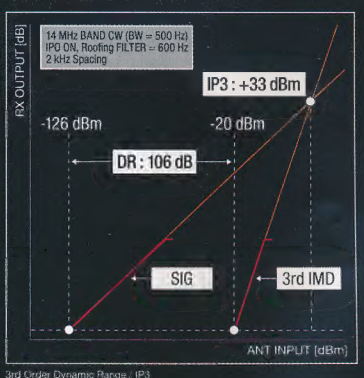

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Amateur Radio

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This month's cover

Horus 8 launch with Terry VK5VZI, Chris VK5CP, Joel Stanley and Alan Kovacs at the QTH of Graham VK5GH. See the story of Project Horus commencing on page 22. Photo by Scott Testi VK5TST.

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are welcome and will be considered for publication. Articles attached to email are especially welcome. The WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

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The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Representing
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Editorial

Peter Freeman VK3PF

WIA Annual Conference – an enjoyable trip

The WIA Annual Conference was a success. The team from the Sunraysia Radio Group did a terrific job for all who attended, regardless of which activities one participated. The technical program on Saturday afternoon was an interesting mix of topics, with two presenters making their contribution from afar through the use of technology. From all accounts, the Partners' Tour was also a resounding success.

The social activities were well attended and enjoyed by all. Good food, great company and some liquid refreshment was accompanied by much discussion about all sorts of topics, not just radio. The Friday and Saturday dinners had excellent local speakers who entertained all present.

Despite the early hour and the brisk morning, there was a good turnout of people at the Old Aerodrome Sporting Complex to watch the launch of the two Horus balloons. Several people had a variety of equipment set up, either to monitor the progress of the balloons or to simply "play radio". Once the first balloon (Horus 26) was launched, many amateurs used their hand held radios to make contact through the balloon-borne cross-band repeater, even if it was only with the control station.

As I had been discussing my portable antenna with several people on Saturday, I quickly erected the system – a multiband switchable inverted V dipole supported by a squid pole, fed with RG-58 to a FT-817 powered by a Lithium Polymer battery. The system is relatively lightweight and was used during the trip to activate several National Parks and SOTA summits.

Those that had arrived at the launch site just before the release of Horus 26 were able to watch the preparations of the balloon and payloads for the second launch – Horus 27 with an imaging payload. We watched the balloon disappear from sight and wished the chase teams good fortune prior to making our way back to our hotels or other activities before heading to the jetty to board the Paddleboat Mundoo for the cruise on the Murray River.

With a good crowd on the Mundoo, the atmosphere was a very social one. I was able to occasionally check the progress of the Horus flights and the chasers by looking over the shoulder of one of several people on board who were monitoring via tablet devices.

At the rear of the vessel, a squid pole vertical antenna was lashed to the guard rail, with an antenna tuner at the base. The coax led into the rear cabin, where a station was set up and operated using the special event callsign VK102WIA. The operators were kept busy with a steady stream of callers, including a couple of operators on board the Mundoo who did not let the lack of an antenna stop them from making contacts – the FT-817 was simply held progressively closer to the VK102WIA antenna until sufficient signal was coupled to the antenna from the rear connector of the FT-817!

The cruise included some commentary on the sites of interest as we progressed upstream. The call for lunch was announced; again the meal was enjoyed by all.

Continued on page 6

WIA comment

Michael Owen VK3KI

A Code of Conduct

At its meeting in February 2012 the WIA Board prepared a first draft of a Code of Conduct, a code of on-air conduct, which was released on the WIA website and in the April 2012 issue of *Amateur Radio*, inviting comments, with a view to further discussion at the Open Forum at the WIA Annual Conference 2012 at Mildura.

We received a number of thoughtful responses, but all, interestingly, supporting the concept of a Code.

One of the suggestions received was perhaps that we should be clearer about why we have a Code, perhaps a reminder of the unique privileges of the amateur service and even a reminder of the spirit of amateur radio.

I must say that I was initially a bit reluctant about that. Perhaps it was a feeling that in today's world we are doers, and many people could think that in today's world what we regard as a right was in yesterday's world regarded as a privilege. Perhaps it was all a bit too old fashioned for an organisation desperate to attract a younger generation.

Then, in an entirely different context, I received an email from a Foundation licensee, who told me that he is an undergraduate student, but thinks that amateur radio is being killed by having the level of knowledge for both Standard and Advanced certificates of proficiency too high.

That brought me full circle, back to the issue of privileges that the comment about the code had raised.

I drew my correspondent's attention to the fact that the Australian syllabus for Standard and Advanced certificates was not higher than the rest of the world. For example, the Australian Advanced level conforms to the CEPT (The European Conference of Postal and Telecommunications Administrations) HAREC (Harmonised Amateur Radio Examination Certificate) syllabus, which enables Australian Advanced amateurs to operate without doing more while visiting some 32 other countries.

Why is the level of knowledge required for an amateur certificate what it is?

The amateur service has access to a family of frequencies across the spectrum. The Standard and Advanced radio amateur can modify a transmitter built for other purposes to be used on an amateur frequency. Indeed, not only does the radio amateur not have to use type approved equipment, he or she can make his or her own transmitter. And it does not have to be checked by the regulator before it is used. In addition, there are not many other spectrum users who can be frequency agile.

In short, since radio all began, the extent of regulatory control of the radio amateur has been minimal.

Pretty obviously, the radio amateur has to know enough not to cause interference to other users of the spectrum, whether it be the reception of entertainment or a safety service.

So, the more I have thought of it, the more a Code of Conduct is really appropriate, and so, the decision of the Board to adopt a code at its meeting following the Annual Conference was right.

One of the really useful contributions to the discussion came from a very respected amateur who pointed to the much more detailed IARU Region 1 publication "Ethics and Operating Procedures for the Radio Amateur" written by John Devoldere ON4UN and Mark Demeuleneere ON4WW.

That is readily available on the IARU Region 1 website, as well as the IARU and IARU Region 3 websites.

While it contains much useful material, I think it may be a bit too detailed and a little too European to be really accepted as the ultimate guide in Australia.

But I do accept that the Code is necessarily brief and for certain uses parts could be enhanced by either further explanation or examples to clarify the meaning. I accept that the Code is only a starting point for the new or aspiring radio amateur.

But as it is, it is a reminder to all of us that how we operate our station is seen in a very public arena and that if one of us ignores proper operating techniques, uses inappropriate language, transmits matter that should not be transmitted on amateur bands, defames individuals or otherwise abuses our privileges, we all suffer.

Remember the value of the radio spectrum. It may be a reusable resource, but it is a very finite resource. Many compete to use it.

How we use the spectrum allocated to the amateur service may be watched by those who covet the spectrum we occupy.

I do not believe that I live in some long departed time rather I live in today's seriously competitive world when I say "Let the Code guide us all."

Continued on page 5

WIA news

Board decides to continue Club Grant Scheme

Following the very successful WIA Annual Conference 2012 in Mildura, the WIA Board met on Monday 28 May 2012 and among the matters it considered was the WIA Club Grants Scheme.

The question as to whether the Club Grants Scheme should be continued was raised in the Comment in the December 2011 issue of *Amateur Radio*, and comments were invited.

While little response was received to the Comment, a very productive discussion ensued at the Open Forum following the Annual General Meeting as part of the Annual Conference.

It was clear that almost everyone thought that the criteria for a Grant had become too complicated, and that rather than a project being innovative in an identified way, it should simply be useful, for amateur radio, the WIA or the club.

The Board decided to continue the Scheme, and adopted new Rules with a much simpler and wider test for a Grant.

The Board felt that some suggestions could not be adopted, but did allocate a sum of $6,000 for the current year as the maximum sum to be distributed this year.

The test for a Grant is now for "a project to receive a Grant under these Rules it must be considered by the Grant Committee and the Board to be sufficiently useful for any one or more of amateur radio, the Affiliated Club or the WIA to justify the making of a Grant."

The new Rules are on the WIA website together with a new and hopefully user friendly application form.

The Board has set the date by which applications for Grants are to be lodged to be Monday 20 August 2012.

WIA Board meets in Mildura

NZART President Vaughan Henderson ZL1TGC was welcomed to the WIA Board meeting in Mildura on Monday 28 May 2012.

The Board reappointed Michael Owen VK3KI as President and Phil Wait VK2ASD as Vice President.

The Board formally confirmed its previous decision to appoint Trent Sampson VK4TS Acting Director Awards until Chris Platt is able to resume the role and to appoint Bob Robinson VK3SX as Awards Manager.

The Board also reviewed a number of its previous decisions and set new time frames for a number of matters and provided significant guidance to the Awards Committee on other matters.

The Awards Committee will be making various announcements in the near future.

The Board accepted with regret the resignation of Sarah Thompson VK3SD as Secretary, effective from 30th June 2012, and appointed David Williams VK3RU as Secretary with effect from 1st July 2012.

Following the Board meeting, the President, the Treasurer and the WIA Manager met with Sunraysia Radio Group Secretary Noel Ferguson VK3NF to review all aspects of the Annual Conference in Mildura. Also present was WIA Director Bob Bristow VK6POP, who is taking a leading role in coordinating the 2013 Annual Conference which will be held in Perth, WA.

Peter Young VK3MV Awarded GA Taylor Medal

A number of amateurs were recognised at the Annual General Meeting/Open Forum at the WIA Annual Conference Mildura 2012.

Former Director, but still responsible for Government Liaison and the Monitoring Service, Peter Young VK3MV was presented with the GA Taylor Medal, one of the most prestigious awards made by the WIA, in recognition of his unique contribution to amateur radio.

The Chris Jones Award was presented to Gavin Reibelt VK4ZZ in recognition of his contribution to the Townsville Amateur Radio Club and to the WIA Exam Service and, at the same time, his untiring promotion of amateur radio in his community.

The Ron Wilkinson Award was presented to Dale Hughes in recognition of his work with WRC-12 including as a member of the Australian delegation and his many technically excellent articles published in *Amateur Radio* magazine.

The Al Shawsmith Award for journalism was presented to Justin Giles-Clark VK7TW for his article 'Modern communications technologies - a quick Centenary review and the future', published in the December 2011 issue of *Amateur Radio.*

The *Amateur Radio* Technical Award was presented to James (Jim) Tregellas VK5JST for his articles 'An introduction to stepper motors' and 'Building an 80 metre magnetic loop antenna for your attic', published in the May, July and August 2011 issues of *Amateur Radio*.

The Higginbotham Award was presented to David Clegg VK5KC for his many activities over the years supporting amateur radio, the WIA and the clubs.

In addition to the President's Commendations presented to the WIA's Nominated Assessors reported below, President's Commendations were presented to Neil Husk VK6BDO for his outstanding work in relation to HAM college, Keith Bainbridge VK6XH for his many years of contribution, including his contribution to the Awards program and Onno Benschop VK6FLAB in recognition

of his active participation in many aspects of amateur radio as a newly licensed amateur.

David McAulay VK3EW and Alek Petkovic VK6APK were both honoured by a President's Commendation for their ongoing contribution to the WIA Awards Committee.

WIA's Nominated Assessors honoured at 2012 Annual Conference

The WIA's Examination System relies heavily on its Nominated Assessors, highly qualified Assessors who perform regular audit functions, conduct Special Assessments and other functions and are central to the efficiency and credibility of the system.

The WIA Board had decided to recognise their contribution by awarding each of the 24 Nominated Assessors a President's Commendation.

Five of the WIA's Nominated Assessors, Terry Ryeland VK2UX, Peter Watts VK5ZFW, Trevor Quick VK5ATQ, Eric Van De Weyer VK2VE and Philip Adams VK3JNI, participated in the WIA's Annual Conference 2012 held in Mildura on 25, 26 and 27 May 2012, and were presented with the Commendation.

Terry Ryeland accepted the certificates on behalf of the other Nominated Assessors who were not present.

The other Nominated Assessors are Roger Cordukes VK4CD, Peter Willmott VK3TQ, Ron Bertrand VK2DQ, Larry Lindsay VK2CLL, Peter Dowde VK7PD, Colin Pomroy VK3BLE, Craig Cook VK3CMC, Lyle Dobbs VK4LM, Trevor Connell VK8CO, Laurie Pritchard VK4BLE, Dale McCarthy VK4DMC, Tony LaMacchia VK2BTL, Ian Ellings VK7QF, Paul Hoffmann VK5PH, Owen Clarke VK3BC, Steve Tregear VK3TSR, Scott Habgood VK2UBQ, Kathi Suminer VK6KTS and Gail Lidden-Sandford VK4ION.

WIA President Michael Owen paid a warm tribute to their contribution to amateur radio and the WIA.

WIA comment

Continued from page 3

Code of Conduct

Recalling amateur radio's proud history as a self regulating user of a unique family of frequencies;

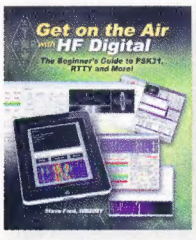
Recognising the value of maintaining the "Spirit of Amateur Radio" so valued by generations past, and

Acknowledging the importance of a continuing justification for access to spectrum and the special privileges enjoyed by radio amateurs:

The Wireless Institute of Australia adopts the following Operating Principles to guide all Australian radio amateurs.

Australian radio amateurs will:

- act with integrity;
- ensure that our station is safe for ourselves and for visitors;
- show respect and courtesy to our fellow amateurs and all who use the spectrum;
- comply with our licence conditions and all laws and regulations that govern the installation and operation of our station;
- strive to promptly resolve any problems arising from the operation of our station;
- be mindful that we should not transmit anything that may cause offence to others;
- strive to improve our technical and operating skills;
- use our skills to assist our community in emergencies;
- promote the benefits of amateur radio to our community, and
- encourage others to participate in amateur radio.



Get on the Air with HF Digital

WIA Member Price: $30.00 Retail: $35.00

It is a step-by-step guide that will get you started in the fascinating world of **HF digital technology**.

Written in an easy to understand, conversational style, this book will show you how to set up and operate your own HF digital station.

The text includes instructions for configuring software programs for popular modes such as RTTY, PSK31 and JT65.

You'll also learn about other digital communication modes such as MFSK, Olivia and PACTOR.

Editorial

Continued from page 2

Once again, discussion continued amongst friends old and new and perhaps too early for some we arrived back in Mildura to disembark.

The formal events for most concluded with an even more social barbeque at Fergus Park, the home of Noel VK3FI.

I met with the Board on Monday morning to discuss aspects of the work of the Publication Committee prior to departing on my trip toward home.

During my travels to Mildura, I had activated four National Parks and one Summit on the Air (SOTA) summit using the FT-817 and inverted V antenna. The plans for the trip home had a similar theme. More National Parks to add to my tally of Parks activated towards the Keith Roget Memorial National Parks Award, plus some SOTA summits. The plan was a little loose – basically head towards the south with a meandering route to allow entry into most of the National Parks in the west of Victoria. Then to head back toward Melbourne along the coast.

The end result of the overall trip was that I activated 16 National Parks and five SOTA summits over an eight day period, with three days spent at the Annual Conference in Mildura during those eight days. I thoroughly enjoyed the break from the usual routine.

DX News columnist to retire

I have been advised that John Bazley VK4OQ will be retiring from his role as the compiler of the DX News column in the near future – his last column will appear in the August issue of *AR*. John has undertaken this role for the past eight years. The Publication Committee thanks John for his outstanding contribution over this period. We are currently exploring options to ensure that the column will continue.

Cheers,

Peter VK3PF

WICEN (Vic) Communications at the Arthurs Seat Challenge

Paul Whitaker VK3DPW - WICEN Event Co-ordinator

Photo 1: WICEN volunteers on the day, (left to right): Phil VK3FDAA, Graham VK3KMG, Ian VK3IFM, Ken VK3HKV, John VK3FR, Les VK3MLM, Ross VK3SF, John VK3CVF, Gerard VK3GER, and Paul VK3DPW was safely behind the camera.

Figure 1: The WICEN banner.

One of the many events WICEN participate in happened on 6 November, 2011. Here is a report of the Arthurs Seat Challenge, from a communications angle. Arthurs Seat is a large hill, about 320 m high, on the western coast of the Mornington Peninsula, about 50 km south of Melbourne.

The Arthurs Seat Challenge is a charity event raising funds for the 'Fit to Drive' teenage driving programme in schools thought Victoria. It is held every year on a Sunday morning, when roads are closed around Rosebud and Arthurs Seat for approximately four hours. There were more than 2000 participants who sprinted, jogged, walked, crawled and even a couple of babies got pushed in a stroller, from the Rosebud Pier to the top of Arthurs Seat, a distance of nearly seven kilometres, within a two hour time limit. This is the first year that WICEN (Vic) has been involved. Previously, the organisers used mobile phones for safety and logistic communications.

Photo 2: Competitors crossing the Finish line.

We handled various logistic and official messages, made enquiries for the public, and had a lovely time sitting in the shade on top of Arthurs Seat watching LOTS of people 'heaving' and 'sweating' across the finish line! This is one of those events where I have no desire to be on the other side of the fence!

There were no health or safety issues on the day, but Ken had a great time practising CPR in the back of the St John Ambulance! The Arthurs Seat UHF repeater was not operating at its full potential. Operators at checkpoints in close to the hill had difficulty accessing the repeater, so two metre simplex handled the more difficult locations of checkpoints. We had seven checkpoints spread along the course. All the checkpoints used handheld radios, and at the Finish, we set up a two metre portable station using a ground independent antenna on a 10 metre mast, with 20 watts. The pager interference was reduced by choosing a frequency low in the band, and using a low gain antenna. For access into the UHF repeater, Finish only needed a handheld, as the repeater is located 400 metres away.

We used special callsigns for the network. Callsigns such as Start, Point 17 and the like are allowed with the authority of ACMA. Announcements to the effect are made regularly. WICEN do not need, or have the right to demand, exclusive use of particular repeaters or frequencies. We do however ask for the cooperation of amateurs in minimising traffic on a frequency in use for a WICEN exercise.

We had three Southern Peninsula Amateur Radio Club (SPARC) members involved, with a new F call who proved valuable exercising his CFA skills directing traffic at the roadblock on top of the hill - onya Phil! - thrown in at the deep end, and swam well!

This is one of many training exercises WICEN conducts in conjunction with community events each year. These events provide WICEN operators with practice passing traffic accurately, and the opportunity to test their portable equipment. It also gives good exposure to amateur radio in the community. If you'd like to participate, contact your local WICEN coordinator. Contact details for Victoria are on our website at *http://www.vic.wicen.org.au*

My thanks to all the operators that participated. Job very well done!

Photo 3: Checkpoint 17, at the start of the climb!

Photo 4: The portable field station at FINISH. The visitor was John Vardanega VK3BCR, also a WICEN member, but working as a volunteer with ROTARY for the day (I think he dropped in to check out what we had to drink!). With Graham VK3KMG and John VK3CVF, our expert logkeeper.

Report on the WIA Annual Conference Mildura

Onno Benschop VK6FLAB

For many arrivals in Mildura the first taste of hospitality was the airport arrival lounge where local amateurs were waiting to provide personal transport to accommodation. After check-in, registration was one stop in a whirlwind of meeting amateurs left, right and centre. Mal Brooks was handing out the registration packs together with a locally grown mandarin and maps to aid navigation through Mildura.

The Friday afternoon was topped off with a visit to the local boutique brewery pub where we sampled some local ales. A brisk walk around the corner and we were on the way to Settlers where the amateurs outnumbered the locals three to one, but they took it in their stride and dinner was on the way in the blink of an eye. The buffet style meal was punctuated by local Balloon Pilot and all-round Scotsman, Alan Cameron who regaled several tall tales, some of which may have had a little help from the local brew. Dinner was accompanied by local musicians who kept up a lively flow of song and music.

Breakfast the next morning was a social affair with amateurs making their way to the central dining hall where all manner of great food was available, and as food goes, Mildura kept up its end of the deal with great food the whole way through the weekend. Afterwards a quick registration for the AGM - every current WIA member was presented with a blue voting card - not that we needed to vote on anything in the end, but being prepared is always par for the course.

WIA President Michael Owen VK3KI ran a tight ship and after opening the AGM celebrating 102 years of the Wireless Institute of Australia at 09:07 and the acceptance of apologies we stood for a minute silence to acknowledge the silent keys who passed in the last year. 65 WIA members and 55 further Amateurs, two Life Members among them. The minutes of last year's AGM were accepted and the financial report was passed without comment. New Directors were introduced and at 09:13 the AGM was all done and dusted.

Next item on the agenda was the annual awards and President's Commendations.

After the awards, we started the Open Forum Discussion. Discussions were productive and engaging about many issues close to the heart of Amateur Radio, including several proposals to promote our hobby to new audiences and the future of the club grant scheme. There was discussion about how successful the club grant scheme had been, whether it was too confining in its requirements - one example from the floor was that it should be possible for the club-grant scheme to be used to buy tins of paint because it might well be that this would be the most important thing for a club to spend money on and one member stood to ask for exactly that - having just moved into a hall that needed more than some TLC. During morning tea - which included several nice pastries - several discussions continued on and the topic of promotion of the hobby was discussed.

After lunch we had four technical presentations. We saw a demonstration of Amateur TV, saw satellites launched into space, heard about how audio chirps help determine propagation and saw amazing footage and inventiveness with project Horus.

Pre-dinner drinks were enjoyed by some, but yours truly was putting together the announcement for the conference next year in VK6 and you'll hear more about that in the news next week. Dinner was accompanied by classical music and a classic speaker who had

Photo 1: The participants gathered on the forward decks of the Mundoo after an enjoyable cruise on the Murray. Photo by Robert Broomhead VK3DN.

Photo 2: The top end of a Horus balloon train. See also Figure 6 on page 24. Photo by John Longayroux VK3PZ.

a lifetime in media and commercial broadcast radio and had many tales to tell about radio in Mildura.

For early risers the next morning, there was the opportunity to witness two Horus launches, weather balloons with electronic payloads. One of the launches had a repeater as a pay-load and many amateurs used it to check-in with VK3WIA.

Meanwhile, the festivities continued on the Paddle Ship Mundoo - where among the food and fun we had a live shack operating the call-sign VK102WIA - try saying that in a hurry. Many amateurs took the opportunity to operate the station and QSOs were had with New Zealand, VK6 and Russia. At several times signal reports were quite strong but some detective work determined that a few hams decided to make call-backs from the boat - anything for a QSL card.

After lunch and a group photo we made our way to the QTH of Noel Ferguson VK3FI who opened up his home and his shack for all of us to be inspired by. A life-time of building is visible in Noel's shack and his attention to detail comes with a dry wit which saw the local bag-pipers come by to annoy the President of the Sunraysia Radio Group. The BBQ was of the same high standard that Mildura offered throughout and it was topped off with a masterfully called raffle, under the auspices of Ray VK3HSR.

And that's how it ended, laughing into the distance. What an experience! Next year we'll have to put on a great show to top this one.

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The SCRC (VK3KID) play the VK/trans-Tasman 80 metre phone contest

Michael Romanov VK3CMV

Members of the Sherbrooke Community Radio Club (SCRC) VK3KID got off to an early, mid-week start, during the second week of May, commencing preparations on the 10th by packing up voluminous quantities of radio equipment, plus half a ute load of wire antennas, a generator, one nine metre tall aluminium extension mast, and 'Flickee'.

Following much later, after the large ute load of operating equipment arrived on Friday morning, were four carloads of other various, far less important, mere life support items, such as food, clothing and bedding. All of this was for the purpose of undertaking their annual 'Sacred Pilgrimage' event, the VK/trans-Tasman contest.

Members and visitors travelled to Kurth Kiln Regional Park, near Gembrook, for the assembly of a substantial wire antenna farm and portable HF station at the historic, heritage listed, Kurth Kiln Charcoal making camp.

Club president Jim McNabb VK3AMN who shall now, henceforth and hereafter, be officially titled and addressed as 'El Presedente' and new club member Michael VK3CMV commenced assembly of the wire antenna farm mid Friday morning, finishing just before sundown.

Three very substantial wire antennas were hauled skywards, courtesy of 'Flickee' and six of the local 35 metre tall 'mountain ash' antenna supports.

Number one antenna consisted of a full size folded dipole, fed by a 4:1 current balun into a resonant quarter wave 75 ohm transformer section and then another quarter wave of 52 ohm coax into the main operators shack. This antenna was aligned by hand compass, broadside to ZL on a bearing of approximately 125 degrees.

Photo 1: The Kurth Kiln huts in the Kurth Kiln Regional Park.

The second antenna erected was a single element, square configuration, quad loop with the flat top mounted at approximately 20 metres above ground, fed directly at the centre of the base, by a section of quarter wave 75 ohm coax into another quarter wave of 52 ohm coax running back into the shack. Again, the hand compass was used to align the quad loop, on bearing 90 degrees, giving east/west coverage.

Antenna number three was the ever reliable G5RV, mounted at 20 metres above ground, aligned at 45 degrees, giving broadside coverage to Queensland and other compass points to the north-east.

A local communications link was also established, via a portable EchoLink node, VK3KID/L. The main historic shack became the 'Operating Shack' with members preparing for camping overnight in several of the other smaller shacks also on the reserve.

Club members then very successfully participated in the 80 metre phone section of the contest, logging over 240 contacts during the six hour contest period from 1800 -2400 EST on Saturday. Numerous contacts were made into all mainland Australian states, with excellent signal reports being received. Considerable numbers of ZL contacts were also logged, with the four New Zealand regions being worked.

Marcel VK3FAAJ, John VK3JRB, Jim VK3AMN, Leo VK3FLMR and Michael VK3CMV all thoroughly enjoyed their pilgrimage to the high forest and the 'VK/trans-Tasman' contest. For Leo VK3FLMR it was his very first foray into the battlefield of a phone contest and a real baptism of fire which he handled

with great efficiency. Well done Leo.

Most members elected to camp overnight in the historic timber huts, alternating between huddling around the glowing camp fire drum outside the main 'Operating Shack' and the occasional trip inside to participate, observe the frantic activity at the microphone and the logging laptop, or simply to boil the kettle for a regular cuppa, and recharge with essential nourishment, in order to keep the very chilly evening conditions at bay.

Sunday morning saw many bleary eyed faces emerge from the huts to make breakfast and then gradually disassemble the station and wire antenna farm, in-between the persistent rain showers. Members departed late morning for their various homes all having enjoyed a great weekend.

Photo 2: Michael VK3CMV and Leo VK3FLMR at the VK3KID operating position.

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Will be at the Albury/Wodonga Hamfest – 29 July 2012

VK3news

Tony Collis VK3JGC

Geelong Amateur Radio Club - The GARC

Photo 1: From left to right - Dallas VK3DJ who built a crystal set almost entirely from car parts, Derek who demonstrated his grandfathers original crystal set, Courtney VK3FGIR whose crystal set was tuned by rotating the pigs snout coupled to a multi tapped coil, David VK3QM with his 'bread board' crystal set and Bert VK3TU with his toggle-tuned crystal set.

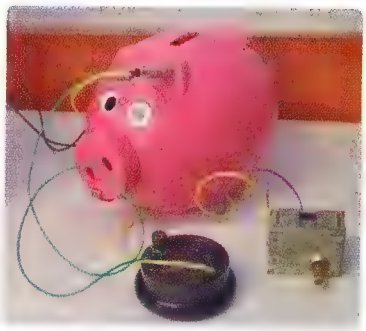

Photo 2: The tuneable snout by VK3FGRL.

Photo 3: In a replica telephone stand, by VK3FUNY.

Crystal Set Construction Night

The awards night on 27 April provided ample evidence that in spite of the enormous commercialisation that abounds within amateur radio it is still possible to generate interest in the construction of the most basic of communication devices – the crystal set.

The evening was a resounding success and stemming from this it is planned for more evolutionary jumps from the crystal set into further competitive construction forays involving the *'forgotten'* technologies from all our yesterdays.

The full set of equipment entered can be found on *www.vk3atl.org* within the *crystal set* link provided. But Photos 3 and 4 show a couple of the more bizarre entries from the many and varied crystal sets offered up.

Photo 4: Part of the audience in the clubs presentation room, with the exhibits on the right hand side table.

VK7news

Justin Giles-Clark VK7TW
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w *groups.yahoo.com/group/vk7regionalnews/*

Congratulations to Rex VK7MO and Alan VK3XPD who established the first VK 10 GHz EME digital record. This contact proved that a small portable field day type station can successfully complete a 10 GHz digital EME contact when lunar libration is low.

Over the Queen's Birthday long weekend in June there was an event of national significance happening in St. Helens in NE VK7. No, it wasn't the Queen's Diamond Jubilee, it was the Tom Quilty National Equine Endurance Championship. The weekend saw well over 100 horses, riders and support crew ride a 160 km course in and around the bush of St Helens over a 24 hour period. At the time of writing this column 32 registered communications support people were heading to NE VK7. This was made up with 20 from WICEN South, five from CCARC, five from NTARC and two from the Land Rover Owners Club of Tasmania. The 160 km ride is made up of five legs of decreasing length with 13 checkpoints at six different locations. I am sure there will be an article on this national event in a future *AR* magazine.

Cradle Coast Amateur Radio Club

Dave VK7EX lets us know that CCARC have been busy with preparations on their VK7RMD Mt Duncan two metre repeater refurbishments. The deep cycle batteries, wiring and controllers are all being replaced. This repeater is only accessible by walking up a steep heavily wooded slope or by helicopter and deep cycle batteries are not something you want to have to carry up those slippery bush tracks! Four very dedicated amateurs lugged the battery retrieval crate to the top of Mt Duncan and made all necessary changes and upgrades in readiness for the day the helicopter delivers the new battery box and takes the old batteries away. A great big thank you to our resident mountain men, Steve VK7NZL, Winston VK7EM, Chris VK7KEE and Dick VK7DIK.

Photo 1: Atop Mt Duncan are Steve VK7NZL, Winston VK7EM, Dick VK7DIK and Chris VK7KEE. Photo courtesy of Winston VK7EM.

A reminder that the WIA and VK7 Regional News broadcasts are rerun every Tuesday night from 8.00 pm from Mt Duncan on 146.625MHz by Winston VK7EM, with call backs.

Northern Tasmania Amateur Radio Club

Congratulations to Frank VK7BC who received his IOTA 800 Islands Award from the Radio Society of Great Britain. This is a first for a VK station and one of only two going to the Oceania region. Frank also claimed the Worked All Antarctic Directory Award for working all 28 Antarctic bases and Frank is only the second recipient in VK. Congratulations also to Peter Dowd VK7PD on his recent retirement and his WIA President's commendation for Nominated Assessor.

Brendan VK7FESQ, Joe VK7JG and Peter VK7PD ventured up to the VK7RBH repeater atop Ben Lomond, at 1570 metres, and found the antenna on the ground and the mounting pipe snapped. The wavelength of the pin of the N-type connector unfortunately did not match the 433.050 MHz input frequency resulting in a distinct lack of sensitivity! A quick rearrangement to the mounting and new heliax and the antenna and repeater were back in operation.

NTARC's May dinner meeting was very well attended and by all accounts the presentation by colleague and fellow astronomer Martin George on Grote Reber's life and research was excellent. A quick reminder about NTARC's informal coffee mornings each Monday and Friday at Friends Cafe in Jimmy's complex in Charles Street, Launceston, where the start time is 10.30 am.

Radio and Electronics Association of Southern Tasmania

Congratulations to Ian Ellings VK7QF on his WIA President's commendation for Nominated Assessor and also congratulations to our four new Foundation licensees Lee Kuskopf, James Leech, Tony Hills and Andrew Oosterkamp who recently passed their assessments and at the time of writing are awaiting their callsigns.

REAST's May presentation was a focus on RF, GPS and transport which was entitled Planes, Ships and Automobiles (+Horses)! Thanks to Tony VK7VKT and Rex VK7MO who talked about ADB-S aircraft tracking with practical application for aircraft scatter. Thank you to Andrew VK7AW who gave a detailed presentation on AIS for ship tracking. Thanks also to Roger VK7ARN and Scott VK7HSE for completing the trifecta with a presentation on APRS and how it is used for vehicle as well as horse tracking. The presentations have been recorded and will be in the DATV video library very soon.

Silent Key

Mark Finlayson VK7FMDF

I have to inform you that Mark VK7FMDF died on Monday night, 14 May 2012 after retiring for the night. He had that night done a lighting design job for the Uni Review.

He was a harmonic of Rod VK7TRF, son of mum Jan, brother of Scott VK7FSCO and sister Alice, and a much loved uncle of two. He was aged 33.

While not very active on air, Mark had a keen interest in things electronic, and theatrics, but lighting design/operating was his forte, being a member of the Hobart Repertory Theatre. Other interests included digital photography, 4WD, radio (both amateur and volunteer public stations) and assisting with TARGA when his very busy schedule permitted. He also had his own public address and lighting gear.

Although having three diplomas, he was doing a part-time course at university, as well as working for Staging Connections.

His family will miss him intensely.

Vale Mark.

Submitted by his Dad, Rod VK7TRF.

Over to you

A digital *Amateur Radio?*

In your June editorial, you note that you have received little feedback about making *AR* available electronically.

I've had very little opportunity to read *AR*, because I read very little in the way of paper these days. I read in between meetings, on public transport, in the air and in bed. I don't carry all the magazines I want to read with me everywhere - instead I carry my phone. An electronic version of *AR* would be extremely welcome.

I'd like to ask that in preparing an electronic version of *AR*, a few things are considered. Likely there will be a call for applying DRM, or Digital Rights Management, the ability to protect content against being copied by unauthorised people. On the face of it, this might sound reasonable, but dig a little deeper and you'll soon realise that DRM has no place in amateur radio or society. Specifically, we're a community of people sharing ideas. Imagine that 50 years from now you're confronted with an electronically locked version of *AR* that cannot be used because the key has expired, or the software used to lock it is no longer used. DRM solves a problem that doesn't exist. It's from the accounting mind of Hollywood, not from any member of society who wishes to share information.

Furthermore, I'd like you to consider people who use screen-readers, people who currently are unable to actually read *AR* at all. Creating a PDF is a quick solution, since production generally revolves around PDF files, but you might consider publishing the content as simple HTML pages on a website instead, making it possible to re-use and re-purpose content. Perhaps you might consider a creative commons licence for the content. The simple truth is that we don't know how people might re-use this information. For example, I can make my phone generate text to voice and listen to articles while I'm in the car - who knows what other ideas people might have.

Finally, I can imagine outcries about "giving away our content" - advertisers pay for distribution, eyeballs. Authors want to share their story. Making content scarce or inaccessible is not in the interest of amateur radio. Distributing electronic copies can be all but free, spread the information far and wide and attract people from around the world. If 1% of 1000 people become members of the WIA, we have 10 new members, but if 1% of 1 million people become members, we treble our membership.

If all that a WIA membership represents to a member is *AR* magazine, we have bigger problems. In closing, if cost reduction associated with printing less copies is negligible, I'd like my paper copy of *AR* to go to my local library instead, otherwise, don't print one for me, there are enough dead trees in my office as it is.

Onno Benschop VK6FLAB

VK3 news Amateur Radio Victoria

Barry Robinson VK3PV
e *arv@amateurradio.com.au*
w *www.amateurradio.com.au*

Photo 1: Peter Cossins VK3BFG with his Life Membership certificate.

More on the AGM

We had two surprise presentations at the recent Annual General Meeting. The first was a Life Membership bestowed on Peter Cossins VK3BFG for meritorious service mainly to do with but not confined to amateur television. A report of this occasion and the annual reports from the President and Treasurer in summary form were included in this column last month.

The second presentation went to Jim Linton VK3PC for an outstanding contribution to amateur radio. It was noted that he was already a WIA and ARV Life Member. His contributions are too numerous to mention, but here are a few of them.

Jim VK3PC had a lot of input into the nationalisation of the Wireless Institute of Australia. He has written many articles for *Amateur Radio* magazine and our national broadcast items, and presented them as well. When the new licensing scheme started he was one the first instructors and assessors. He formed the Standard Licence course with Kevin Luxford VK3DAP/ZL2DAP. His has worked for special events such as the Centre Victoria RadioFest, the WIA centenary, the 100th anniversary of WIA Victoria and the VK100ARV eventas well as input into the lighthouse weekend held at Williamstown, and the list goes on.

The past 12 months have been very hard for him. But with his mental fortitude he is battling through and is on the improve, and promising a lot more input to the amateur radio hobby.

A long serving President of WIA Victoria and Amateur Radio Victoria, it is with great pleasure that the Council of Amateur Radio Victoria presented this commemorative trophy. On this occasion he was recognised as being the President from 1983-1986 and 1988-2011 and in being involved in all its affairs over the years.

It was a very surprised and humbled Jim VK3PC who accepted the award presented on behalf of the Council of Amateur Radio Victoria. In accepting the award he described it as coming as a surprise and was humbled by the experience. He also acknowledged the presence of former councillors John Adcock VK3ACA and Derek McNiel VK3XY, along with several current councillors, and members.

Photo 2: Jim Linton VK3PC displays his Service Award.

We show what the hobby has to offer

Amateur Radio Victoria was again portable at the Timeball Tower at Point Gellibrand Coastal Heritage Park in Williamstown for the WIA National Field Day. We had decided to participate in the WIA National Field Day this April on Saturday rather than the usual Sunday due to a number of participants having prior commitments. Terry Murphy VK3UP had his very nice caravan set up with tea and coffee on call together with an array of transceivers for all bands HF, VHF and UHF.

Of particular note was the fairly tall multiband HF vertical which worked very well at that location. As an added bonus a dipole on 40 metres was set up from the top of the tower in inverted vee configuration. An assortment of VHF/UHF antennas completed the ensemble. Helping out on the day was Ian Downey VK3XID, Wayne Bruce VK3VCL, Barry Robinson VK3PV, Tony Hambling VK3VTH and Peter Cossins VK3BFG.

Quite a few contacts were made on a variety of frequencies and Peter VK3BFG had his DVB-S television transmitter set up on 1255 MHz and kept Melbourne abreast of the activities with live and recorded interviews transmitted via VK3RTV1 throughout the day.

The site was made available through a permit from Parks Victoria, and one of its rangers

visited for a considerable time seeing the facility was well used and visited. We were also visited by WIA Director Phillip VK3JNI who is in charge of the weekend and was to visit a number a sites. He was most impressed by our set-up and operation.

The day was very successful with a number of interested people coming over to see amateur radio in action. One lady and her son both had conversations on two metres and time will tell if they and others join the hobby. In all VK3WI had about 125 contacts plus the frequent updates through the VK3RTV DATV repeater on Mt Dandenong.

In the name of KRMNPA

A group of radio amateurs have been able to activate the Wilsons Promontory National Park during a weekend of hiking to the Roaring Meg camp. They were Peter Fraser VK3ZPF, Wayne Merry VK3WAM, Kevin Bedford VK3KAB, Trevor Bedford VK3ATB and Glenn Sneddon VK3YY.

Very keen was Wayne VK3WAM who headed off before the rest of the team and was soon busy setting his antenna which was a vertical with eight radials and tuner. Glenn VK3YY used two random lengths of wire and a tuner while Peter VK3ZPF relied on his now standard switchable inverted vee antenna. In the March activation the team used three battery-powered Yaesu FT-817s and made QSOs across the HF bands on SSB and CW. At the end of the trip they had made a total of 65 QSOs. Despite their best efforts they could not get beyond VK or ZL. Very strange they didn't work any VK4 stations, but there is always next time. Full details of the KRMNPA can be found at *http://amateurradio.com.au/awards*

From HMAS Castlemaine

On this museum ship in Williamstown is our station VK3RAN, and it was active during the ANZAC Day in support of the AM/CW on air event and to support the regular volunteers and public. The Event Leader Terry Murphy VK3UP tried out the Terlin Outbacker multiband mobile whip antenna mounted above the bridge. The VSWR was quickly adjusted to 1.1 to 1 on 40 metres. A check of 20 and 15 also showed a low VSWR and it was assumed to be low on the other bands. It proven to be quite impressive but the local industrial noise was still a problem and at times was 10 dB over S9.

Terry VK3UP quickly suspended his old faithful 40 metre inverted vee from a halyard and that dropped the noise by about 2dB and increased the on air performance by about the same. After operating on 40 metres using both the Terlin and the dipole, with only 100 watts, 20 metres was tried and immediately a Mexican gave VK3RAN a 5 by 9. The Terlin should work very well on 20 metres in the future! Considering the size of the ground plane sitting in the water, a night-time session from the ship is being considered. In excess of 100 contacts were made on the day. Both the crew of HMAS Castlemaine, and Amateur Radio Victoria, deemed the day a total success. We eagerly look forward to future participation in the ANZAC Day event.

The operators on the day were Peter Cossins VK3BFG, Barry Robinson VK3PV, Wayne Bruce VK3VCL, Jeff Swaby VK3HJA and Terry Murphy VK3UP. John Kessner VK3ATV also dropped in for a visit. The main operation was on SSB but occasionally moved to AM and worked a few local and interstate stations. We hope to restore a dedicated AM transceiver in readiness for next year.

Next class session

Enrolments are open for the Foundation licence session to be held on July 21 and 22. For enrolment into the training, assessments or for more details contact Barry Robinson VK3PV via email at *foundation@amateurradio.com.au* or telephone 0428 516 001.

Our recent Standard Bridging Course, again under the tutor Kevin Luxford VK3DAP/ZL2DAP, saw all seven candidates successful and they are now enjoying their new operating privileges and callsigns.

Is your Callbook current?

The WIA 2012 Callbook is now available

www.wia.org.au/bookshop

Contests

Phil Smeaton VK4BAA
e *vk4baa@wia.org.au*

Welcome to this month's Contest column.

WPX CW Contest 2012

Well, what can you say about this contest this year? Simply put - phenomenal. Well, depending where you were, as always. Much of the planet saw 15 metres burst open to allow all manner of DX to be worked. With the band in this condition, a yagi can often be considered to be a disadvantage as signals are arriving at the antenna from all around the world simultaneously. VK stations reported LP and SP openings at the same time, with the familiar echoes to be heard. 10 metres decided not to play as hard as 15 metres, unfortunately.

Vlad VK2IM fell just short of 2000 Qs and six million points and was kicking himself for missing EU openings on 20 and 40. The LP opening to EU on 20 was good, but EU were more interested in NA than VK.

Steve VK3TDX was active, but suffered from a Murphy attack in the shape of a dodgy 15 metre trap on his antenna. Steve reported noise-free 40 metre and 80 metre bands in VK3 and he wasted no time in capitalising as quickly as he could to bag almost 1300 Qs in total for a claimed score of just under 2.7M.

Mirek VK6DXI used his remote station during the contest for the first time and he already has a long list of station improvements. Mirek netted 1876 Qs for a claimed score of just over 4.9M points.

Patrick VK2PN was operating on 'DX-pedition' mode as VK9PN. Patrick also found 10 metres to be a hard slog, with 20 metres and 40 metres being the money bands. The guys got 1444 Qs into the log for a claimed score of just under 3.5M points.

Contest Calendar for July 2012 – September 2012

July	14/15	IARU HF World Championship	CW/SSB
	21/22	CQ Worldwide VHF Contest	All
	28/29	RSGB IOTA Contest	CW/SSB
August	4	TARA Grid Dip	PSK/RTTY
	4	Waitakere (NZART) Sprint	CW
	4/5	10-10 International QSO Party	SSB
	11/12	Worked All Europe	CW
	11/12	**Remembrance Day Contest**	**CW/SSB/FM**
	25/26	**ALARA Contest**	**CW/SSB**
Sept	**1/2**	**All Asian DX Contest**	**SSB**
	1/2	Region 1 Field Day	SSB
	8/9	Worked All Europe DX Contest	SSB
	29/30	CQWW RTTY DX Contest	RTTY

Note: Always check contest dates prior to the contest as they are often subject to change.

For John VK4CT/VK4EMM the contest was an absolute hoot. From the horse's mouth: 'If you are thinking about getting started in radio contesting, there has never been a better time.

Band conditions during the CQ WPX contest was the best that I have experienced in all my years of contesting. Participation is in a growth spurt – in VK/ZL and 'the rest of the world'. I expect these conditions to continue through the peak of the current solar cycle – hopefully for the next two or three years. Band openings on 15 metres were remarkable, with virtually all global paths open during our afternoon and morning sessions. Under these conditions, the antenna for me is a simple dipole favouring Europe. My 15 metre dipole worked South America, Europe and Russia on the long-path at the same time as JA on the short-path. The orientation of my dipole also picked up strong signals from North America. A quick switch to a Yagi antenna picked up the weaker signals from North America. For my efforts with a dipole, the 'run rate' was splendid for two hours in the afternoon session and one-hour in the morning session – with callers coming from virtually 'everywhere'. A message here for beginners is that a 'single-band' 15 metre entry is a good way to get started using a dipole antenna – the higher the better. Another remarkable experience on 15 metres was a complete great-circle path opening from VK4 to VK4. For at least an hour, I clearly heard the last letter of my call as soon as my transceiver switched to receive mode. When I first heard this effect, I thought someone was beginning to respond to my CQ call. No – it was my 'T' coming back. This global path opening was clearly evident when I listened to VK4FJ. No doubt, the use of a dipole helps to recognise a global path opening. The downside in these circumstances is the echo effect. High speed operators are almost unreadable.

An easy way to get started in radio contesting is to contact a team of multi-operators or a single operator who may be interested in a 'multi-single' or 'assisted' entry. You will find a list of VK and ZL contesters who entered a range of categories in CQ WPX contests by visiting the CQ WPX website: *http://www.cqwpx.com/claimed.htm?mode=ph*

The link takes you to the CQ WPX SSB and CW contest 'raw' scores. Raw scores are the claimed scores prior to log checking.

For a comprehensive list of 206 VK contest operators visit:

http://wrtc-rank.com/ctyrank.php?rank_type=claimed&cty=VK

For a comprehensive list of 68 ZL contest operators visit:

http://wrtc-rank.com/ctyrank.php?rank_type=claimed&cty=ZL

Australia's participation is well represented at number 24 out of 206 countries in the World Radio Team Championship (WRTC) events scheduled in 2014. If you are thinking about getting started, stop thinking about it and 'just do it'.'

Couldn't put it better myself. Thanks John.

Changes in WRTC Rules

Following on from last month's (very) brief glimpse into WRTC and its workings, this month sees a slight tweak to the rules.

Originally, WRTC operated as a 'sort of' SO2R type of approach, but with one operator running one station and the other searching for mults or as many new stations as possible and only one signal on air at any one time. The latest rules appear to twist that slightly, stating that the contest is a full Multi-Operator Two-Transmitter type operation (so two simultaneous signals are permitted) but that the only limitation is that each radio must transmit on a different band regardless of mode.

If this rule alteration is indeed the case, the WRTC takes a new approach as M/2, changing the required strategy and decision making format from before. Two stations could indeed be running, but I suspect that the winning formula will be one station permanently running and at some stage a decision has to be made as to when to make the second station stop running and start an S&P approach for multipliers. Without this formula being correct, winning will be more of a hard slog than usual.

However, the selection criteria for WRTC used to allow potential entrants to mix and match single operator and M/2 activities to maximise their WRTC qualification score. The selection rules for 2014 then reduced the points available for M/2 in relation to M/S – which made sense as WRTC was similar to the M/S approach of operating as regards just one signal on the air. These new rules for the WRTC event itself seem to wriggle back somewhat, in that the event appears to be more M/2 than M/S but the qualifying selection points reflect the M/S format still.

The whole process is an interesting creature anyway, in that half of the participants qualify for attendance whilst the other half of the entrants do not. So, it is possible that if you're the Top Gun CW operator of wherever you happen to live, then you might be asked to be the team member of whoever qualifies year after year – and never actually have to qualify at all. Could you imagine the Olympics taking the same stance, with half of the VK team being athletes and the other half not?

It seems to me that a competition would be made up of only those who have personally qualified to be there and by doing as close to as possible what would be expected during the completion. To limit Multi-2 submissions and then turn it into a M/2 contest is ironic. Surely, everyone who competes should have earned the right to be there and what they are doing competing should as closely resemble what got them there as possible. Maybe, the thinking is that the qualifying logic still fits the new format because you qualify as an individual and then pick your teammate - thus putting more emphasis on individual performance for qualification purposes.

Maybe WRTC should be a single operator event and allow SO2R? Making WRTC single operator would

ARRL 2011 10 metre contest results

Callsign	Score	QSOs	Mults
VK4CT (VK4EMM, op)	1,470,016	1,838	223
VK4UC	171,936	527	144
VK4ATH	21,080	156	68
VK4LAT	261,632	1,035	128
VK4NDX	25,668	191	69
VK2HBG	7,120	91	40
VK4BAA	6,624	95	36
VK5AKH	3,190	55	29
VK4FJAM	986	29	17
VK6GD	504	18	14
VK4FATT	336	14	12
VK3AVV	37,556	234	82
VK3GK	36,656	232	79
VK4GH	4,320	56	40
VK2BO	1,406	38	19
VK2PN	90,000	307	75
VK4TT	46,176	148	78
VK3FM	27,940	128	55
VK4DX	17,908	122	37
VK4IU	32,648	158	53
VK4WIL - (VK4HS, VK4MN, VK4QH, VK4SN ops)	1,321,672	1,857	253
VK2GGC - (VK2SJK, VK2MOR, VK2ZMT ops)	156,468	671	118
VK4IZ - (VK4DJH, VK4PDR, VK4TJF, VK4NUT ops)	72,590	348	85

make more sense but it would limit fun from the current 100 to 50 competitors.

Looking at operators trying to qualify around the planet, in some areas it's almost impossible to do so without a serious team behind you. Many seem to be part of teams and participating in major contests as a serious multi operator team member and mostly using 800 point contests for single operator entries. Anyway, in the end, the main thing is to have fun and to create a competitive environment for the participants.

ARRL 2011 10 metre contest results

The long awaited results are in. The band came alive and records tumbled. Peter VK4LAT achieved 14th in the world for his category and VK4ATH set a new Oceania record for his category. The team at VK4WIL kept their crown for another year, but there are rumours of 'others' hoping to give the guys a run for their money in 2012. For casual and serious entrant alike, room was hard to find at times – astonishing when you consider the bandwidth available.

Congratulations to the VK stations who got into the results table on previous page.

If you have any contest related material for inclusion within the column, topics that you'd like covered or even some experiences and pictures you'd like to share, then please feel free to get in touch via *vk4baa@wia.org.au*

See you on the bands.

73 de VK4BAA

The 32nd ALARA contest, 25/26 August, 2012

Lesley Smit VK5LOL

Note: The contest is always on the last full weekend of August.

Eligibility
All licensed operators throughout the world are invited to participate. Also open to SWLs.

Object
Participation: YL works everyone, OMs and clubs work YLs only. One contest (combined phone and CW) run over 20 hours.

Times
Saturday, 25th August, 2012 at 0400 hours UTC until 1359 UTC, then continues on Sunday, 26th August, 2012 at 0400 hours UTC until 1359 UTC.

Frequencies
Bands to be used are 3.5, 7, 14, 21 and 28 MHz only. The following are suggested frequencies for easier location of contacts:

28.380 to 28.410; 21.170 to 21.200 and 21.380 to 21.410; 14.250 to 14.280; 7.070 to 7.100 and 3.560 to 3.590.

Operation
Single operator only (one operator per call sign). NB: If YL is operating as a 2nd operator her husband/ partner cannot participate in the contest. Every individual phone or CW contact may be counted.

There must be an interval of greater than one hour between contacts with any one station on any one band and in the same mode.

No net or list operations. No cross-mode operations. No cross-band operations.

All contacts must be made in accordance with operator and station licence regulations.

Procedure
Phone: call "CQ ALARA CONTEST".
CW: YLs call "CQ TEST ALARA"
OMs call "CQ YL"

Exchanges
ALARA member: RS or RST, serial number starting at 001, ALARA member, name.

YL non-member, OM or Club: RS or RST, serial number starting at 001, name and whether Club station.

OMs, clubs and SWLs work YLs only.

Scoring
Phone: 5 points for ALARA member contacted

4 points for YL non-member contacted

3 points for OM or Club station contacted

CW: All contacts made on CW count for double points

OM, SWL & Club: 5 points for ALARA member logged, 4 points for YL non-member logged

Logs
Single log entry. Logs must show date/time UTC, band, mode, callsign worked, report and serial number sent, report and serial number received, name of operator of station worked, whether it is a Club station, and points claimed.

Sample Log

Date UTC	Time UTC	Band MHz	Mode	Callsign	RS(T) & Serial No. Sent	RS(T) & Serial No. Received	Name	Points
25/2/12	0135	28	SSB	VK6DE	59001	58028	Bev	5
	0141	21	CW	VK3KS	599002	599045	Mavis	10
	0600	14	SSB	FK8FA	59025	59011	Aimee	5
	1103	3.5	SSB	VK3BSP	59130	59006	Joe (Club)	3

Logs must be signed.
Logs also to show full name, callsign and address of operator, and show final score (points claimed). Logs must be legible. No carbon copies. No logs will be returned. Decision of the Contest Manager will be final, and no correspondence will be entered into.

Logs must be received by the Contest Manager by 30th September, 2012.

Contest Manager: Lesley Smit VK5LOL,
4 Perry Barr Road,
Hallett Cove, SA 5158,
Australia.

or to *alaracontest@wia.org.au*

Certificates will be awarded for the following:

- Top score YL overall
- Top score YL phone only
- Top score Australian YL CW
- Top score DX YL
- Top score ALARA member in each country and VK call area
- Top score OM in each continent
- Top score SWL in each continent
- Top score VK YL Foundation Licence holder
- Top score overseas YL CW
- Top score VK Club station

A trophy will be awarded to the following:

- Top scoring Australian YL
- Top scoring Foundation Licence ALARA Member
- The top scoring VK non-ALARA member will be awarded one year's membership to ALARA.

Club Stations
Operators of Club stations may use the Club call only for contacts, and MUST identify each contact as with a Club station. Use of personal callsigns while operating as a Club member is not permitted. A Club station will be recognized as such whether operators are YL or OM. If the Club call is used, the score will be as a Club station.

Please Note: This contest is always held on the last complete weekend of August.

Silent Key

John Stacy VK2JT

Sadly, John Stacy VK2JT became a silent key on 11 May 2012. Among John's passions were amateur radio and photography and he was a well-respected member of HADARC and his local Probus club. John was a keen DXer and made friends in the amateur radio community around the world. He was known as 'Jolly John' due to a friendly and optimistic nature. John was a professional engineer and in recent times John's assistance was invaluable in the mechanical design of the masts for HADARC's Chatswood repeater project. John will be remembered by HADARC members for the presentation on this project that he gave to a club meeting. John had suffered ill health for some time but continued to be optimistic till the end.

As mentioned, John VK2JT had made friends in the amateur radio community around the world. The following tribute was received from John's DX friends: A decade ago, Eric Rogers G3MWN, operating from his amateur radio station in south Yorkshire, England, put out a general call on the 20 metre band and was greeted by a cheery, 'Hello G3MWN this is VK2JJS calling you'. This was the start of a long friendship and countless, almost daily radio contacts with one John Stacy of Gordon, NSW! John's callsign eventually changed to VK2JT but the person remained the same cheerful, jolly and remarkably courageous one who made that first call so long ago. It was not long before other UK radio amateurs in Ted Holmes G4TLY, Peter Day G3PHO, John Lee G0OPA, Gordon Holdom

G4SVU and Ron Barker G4JNH joined Eric in both morning and evening conversations with John. The regular 'net' that developed saw these radio contacts develop into personal friendships as Ted, Peter and Ron met up with John and Ailsa during trips to Australia while Eric and John had the pleasure and privilege of showing the couple some of the UK during their holiday a few years ago. It was not long before others joined in these short wave chats...Boris Nikitin UA3MCJ in Central Russia and Ron Dower VK3UZZ in northern Victoria popped in regularly.

It was plain to all of us that John was a special person, a real gentleman in fact. This attribute was obvious from the on air contacts but was even more so to those of us who met him in person. Peter Day G3PHO and his wife Judy have very happy memories of their stay at Rosedale Road in 2008 when John and Ailsa arranged a wonderful three days of visits, dinners and sightseeing. John seemed to really love coming on the radio to speak to us or send us emails with samples of his photographic work so it was a very sad time indeed when he told us of his daughter Helen's illness and subsequent passing. This alone would have been enough to crush the enthusiasm for life from any one of us but John maintained his forward looking and positive attitude, the same attitude that carried him through years of personal medical problems. He did not like things to stop him enjoying life and, in particular, his family. He greatly valued his radio amateur friends, both in Australia and overseas.

We will all miss his cheery voice very much indeed. Our hobby is much the poorer now that he is gone from the airwaves. To John VK2JT we would like to wish a final '73' and '55' which, in the radio amateur Morse code means 'best wishes' and 'peace be with you'. To his loving and supportive wife Ailsa we send our '88' (love and kisses) and hope that the coming weeks will see the sadness ease. We know she has a lovely family to help her though this difficult time.

It has been our privilege to know John Stacy.

A tribute from members of Hornsby and District Amateur Radio Club (HADARC) and John's friends from around the world, and contributed by Eric Rogers G3MWN, Ted Holmes G4TLY, Peter Day G3PHO, John Lee G0OPA, Gordon Holdom G4SVU, Ron Barker G4JNH, Ron Dower VK3UZZ and Boris Nikitin UA3MCJ, and John's fellow HADARC members.

VK5news

Adelaide Hills Amateur Radio Society (AHARS)

Christine Taylor VK5CTY

The April meeting was another very interesting meeting. We were addressed by Paul VK5SL about some of the interesting problems he has had to deal with in his work life and how the solutions can apply to amateur operation.

The first problem was in a government building in the CBD in which the people were finding that they had trouble getting good signals from any of the broadcast radio stations, (which they needed as part of their work) including those of the ABC. It didn't seem to matter where in the building they were working, the problem remained.

The solution, after some paper problem solving was to improve the earthing of all the electrical and electronic equipment. A number of heavy earth stakes were driven into the ground in the basement which then were all joined to a common earth inside one of the columns of the building. Then on each floor all electrical and electronic devices were linked to the common earth. The result was more than expected. All the local radio stations were received loud and clear and even some of the regional stations across the gulf were heard.

In another building, whenever a telephone hand piece was lifted, the current radio program came through loud and clear. The solution this time was the same. A common earth was introduced and all equipment was linked to it. Problem solved. Since then Paul has adopted the mantra 'earthing, earthing, earthing'. He advises all amateurs to do this with their equipment. He also recommends isolating the aerials from the roof with ferrite beads.

Next Paul gave us a warning from his own experience in his own house. Sometime after the house was rewired he had cause to go up into the roof space to find that due to a fault in the plastic or the plasticiser used on the wires, he found terminals on some of the junction blocks exposed ready for an unwary hand to land on them. He suggests that we be careful where we put our hands on the wiring.

The last part of his talk concerned some of the problems the Government had after they sold the Radio Australia stations at Shepparton to private enterprise. The government still had to check that there was no extraneous radiation from the aerials. They had to measure the strength of the signals at certain distances and heights from the source.

A number of possible ways to make these measurements were considered (poles, helicopters, and blimps) and the best was found to be using a tethered balloon. In the long run a local manufacturer made the balloon, rather than importing one from overseas at a far greater cost. It must had been quite a sight for the local people to see this balloon hovering over the field in front of the antennas, but the result of the measurements was very accurate and repeatable and until it was decided there was no need to continue measuring, this was the means used. The antennas were found to be behaving perfectly and no danger to the public was ever detected.

Paul has also been experimenting at home with a possible replacement for his beam antennas, in view of the problems of climbing towers as ones joints become less pliable. He is suggesting a system of slope wire antennas from a unipole. We may hear more of this in the future if Paul puts pen to paper in *AR*.

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23 cm 36 el. 2 m 1 boom n-con	$249
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Quad 2 el. 20 m heavy duty	$596
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Introducing Project Horus:
High altitude ballooning in South Australia

Grant Willis VK5GR, Matthew Cook VK5ZM, Mark Jessop VK5QI and Alan Kovacs

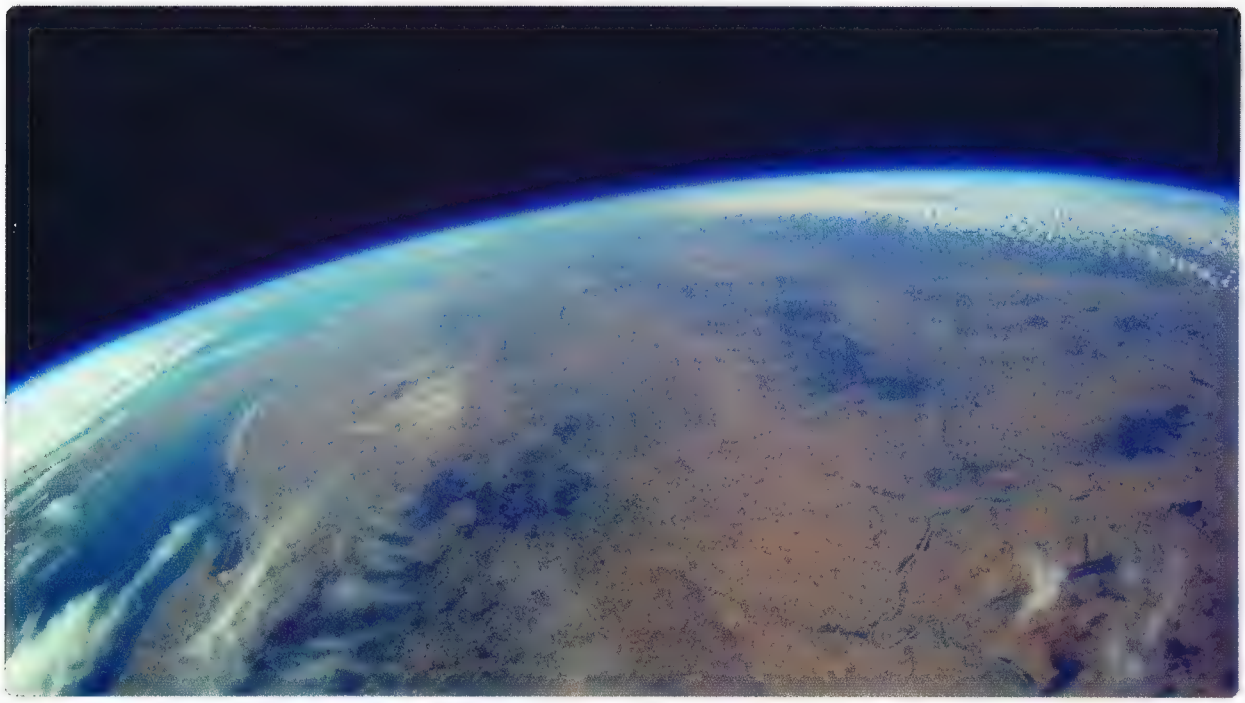


Figure 1: South Australia from 'Near Space' - Horus 12.

Photographs and diagrams by Scott Test VK5TST, Mark Jessop VK5QI, Alan Kovacs and Grant Willis VK5GR.

Where did Project Horus begin?

In late 2009, Terry Baume VK5VZI and a group of friends hit on the idea of flying a weather balloon carrying a camera into 'Near Space', after watching a video of the successful attempt by some students from the Massachusetts Institute of Technology (MIT). Near Space is defined as the region of atmosphere between 20 km and 100 km, after which 'Space' proper is deemed to start.

The MIT students, under the project name 'Icarus' used a GPS connected to a cell-phone to track and recover their balloon. Terry and his friends back in Adelaide thought 'well, if they can do it, why can't we?' and so the journey began.

At first, the plan was to replicate what had been achieved in the USA. Terry made contact with the Icarus group as well as the Cambridge University Space Flight club (CUSF) in the UK to learn more. An assessment of the MIT and CUSF projects was made considering what was repeatable here.

Not long after, Project Horus was born, named after the Egyptian god of the sky. This then is the story of the team's journey into Near Space, and all of the challenges, pitfalls and fun that has been had along the way.

Balloon flight basics

Launching a weather balloon with a few polystyrene boxes tied underneath up into the stratosphere and then tracking them back to Earth seemed like an easy and fun thing to do at the outset. However after a short while and a steadily growing mountain of equipment, software, payloads, and information from other groups, it became clear that launching a high altitude weather balloon was going to be a long series of challenges that would need to be overcome step by step. Since there weren't any other groups in Australia doing this kind of activity at the time, many long hours on the internet were required to research and discuss with others how to overcome each technical challenge. Thankfully the US and UK high altitude balloon community is friendly and willing to assist answering questions no matter how trivial. Then came the red tape.

In Australia, airspace is strictly controlled by the Civil Aviation Safety Authority (CASA). From the very start of the project, obtaining the necessary permits and approvals to fly high altitude balloons was by far the biggest hurdle to overcome. After many letters, telephone calls and months

of waiting, Project Horus was issued with a high altitude balloon permit along with a list of restrictions. Many of the restrictions are specific to the airspace around South Australia, but the most notable is the requirement to inform CASA of any balloon flight no less than 48 hours before launch.

Once CASA has been informed they issue a Notice to Airmen (NOTAM). The purpose of this is to warn other aviators of the balloon's presence, and make sure that when it is released at its appointed launch time there are no aircraft in the immediate vicinity of the launch site. Safety first!

The team also needed to give careful consideration to the design of the electronics being carried aloft. There is very little data or research papers available about flying electronics in 'near space'. The payloads are subjected to punishing conditions, with temperatures as low as -60° C and extremely low pressure both of which contribute surprisingly to problems with cooling in the case of payloads that generate a lot of heat.

Pre-flight prediction

To meet the CASA restrictions, it was immediately obvious that a pre-flight track predictor would be needed. There are also geographic obstacles such as metropolitan Adelaide, Gulf St Vincent, the lower Murray Lakes and the Southern Ocean off the Coorong all of which are obviously undesirable landing zones. Project Horus asked the CUSF group if it too could use their flight prediction system for their flights in Australia. Thankfully they were willing to help.

The CUSF prediction system sources high altitude wind data from the National Oceanic and Atmospheric Administration (NOAA) in the USA. These models describe the wind speed and direction in the upper atmosphere. Once additional details such as launch site coordinates, estimated ascent and descent rates and burst height estimates are supplied, a flight path prediction can be generated.

The flight prediction accuracy improves when run closer to launch

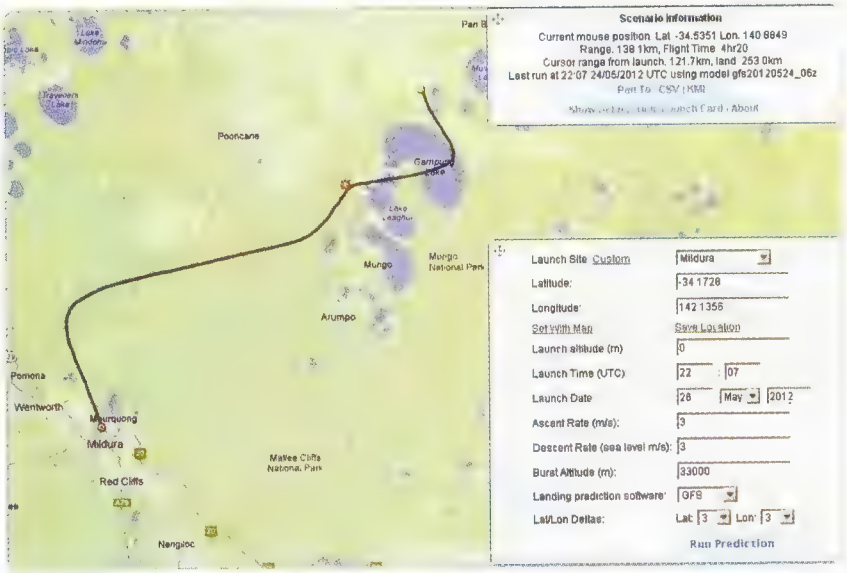


Figure 2: CUSF Pre-Flight Track Predictor - prediction for Horus 26. Mapping courtesy Google Inc.

day. The wind data being used is constantly revised by NOAA with input from weather observations from agencies around the globe. At seven days before launch, landing predictions can be achieved to within a fifty square kilometre area, improving to twenty square kilometres or better when predicted two-three days in advance. This allows the Project Horus team to determine if it is safe to launch, as well as providing tactical information useful for planning payload recovery. It is also why advanced notice of some flights is difficult to provide.

Balloon launch

Launching the balloon is an involved process. The weather balloons used are made from latex rubber imported either from China or the USA. The latex is fragile and can easily become damaged by something as simple as oil present on your skin. Hence, care must be taken when handling the balloons so as to not cause damage before lift-off. The team also needs to be able to estimate how much helium gas is required for each flight and to be able to measure how much lift is generated versus the payload weight. This is important as it affects the ascent rates and flight path.

To further prevent damage to the balloon and simplify handling in windy conditions, the team prefers to inflate it in the safety of a sheltered building. During that time,

Figure 3: Mark Jessop VK5QI holding a payload and Joel Stanley filling the balloon (Horus 14).

Figure 4: Matthew VK5ZM holding the balloon.

the payloads are powered on, GPS lock is verified and the payloads strung together for flight.

The rig that is flown consists of the balloon, a radar reflector (detectable by aircraft proximity radar), a parachute to control the descent speeds, the primary and secondary telemetry systems, and the flight payload.

Figure 5: Adrian VK5ZSN, Josh VK5FMJP, Terry VK5VZI, Alan Kovacs and Joel Stanley launching the balloon train (Horus 23).

Flight computer

The next problem to solve was how the tracking telemetry was going to be generated and relayed to earth. While the Icarus group in the USA had been able to use cell-phones, cellular coverage at the predicted landing sites located in the remote districts of South Australia is not universal. Reliance on cellular coverage would have hampered the team's ability to successfully recover the payloads so an alternative was required.

Instead, Project Horus borrowed ideas originally developed by CUSF-UK and other USA groups who were using low power 434 MHz LIPD transmitters. These were adapted to broadcast 300 baud 7N1 RTTY and proved to be ideal on a number of fronts. In particular, it minimized the weight and power consumption

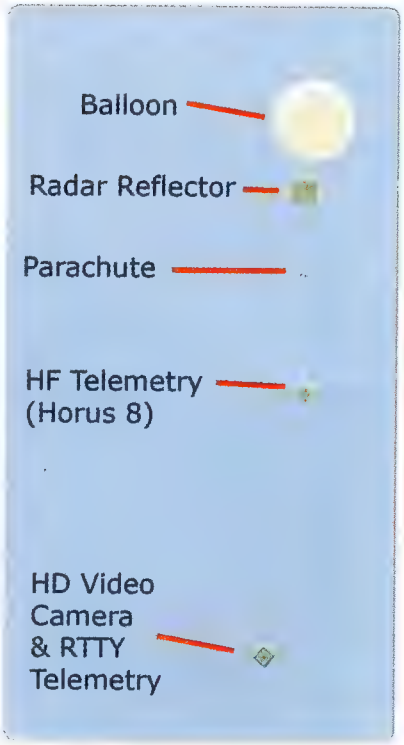


Figure 6: Typical balloon train layout.

requirements. Those two factors combine to reduce the amount of helium needed for a given ascent rate, making it easier to fly higher and longer. Indeed, the beacons today can run for over 24 hours.

Early systems developed by Terry VK5VZI were based on an Arduino microcomputer. These were designated as the original 'Nut' flight computers. More recently, the core PCBs have been redesigned and miniaturised by Mark VK5QI. He developed the new 'MicroNut' boards based on the same Arduino platform used previously, allowing the same software to be used in lighter payloads.

To complete the puzzle, the flight computer's PCBs include a small, on-board GPS receiver. In fact, the GPS receiver itself has presented some major technical challenges. The team found that many GPS receivers are programmed not to report height above 18 km 'or' speeds over 1854 km/h. This is unfortunate since the government restrictions on GPS receivers was written as 18 km 'and' 1854 km/h.

It also needed to be small and light enough to use on the balloon. In the end, suitable modules were sourced that did not have the 18 km ceiling limit and met the weight requirements. Yet one more hurdle overcome.

70 cm primary telemetry system

To make the entire system flight ready, the flight computer/ transmitter board is packaged inside a polystyrene box, complete with four x AA lithium primary cells and an upside-down quarter wave whip antenna. This has yielded a very reliable telemetry beacon transmitter which today flies on every Project Horus flight.

The transmitters broadcast either on 434.075 MHz or 434.650 MHz (plus or minus 5 kHz depending on temperature) allowing the team to fly two balloons simultaneously. The 25 mW RTTY signals have been reliably decoded over 700 km distant from the balloon. The use of RTTY also simplified tracking the frequency drift of the transmitters caused by the extreme cold.

The beacons also incorporated two temperature sensors in their design. One is outside the payload, sampling the external air temperature, while the other is inside monitoring the payload electronics. The external temperature has reached as low as -55° C while the internal temperatures have varied between -20° C and -40° C. This supplied further insights into the environment the balloon experiences.

The temperature profiles measured as the balloon climbs have in fact been a very interesting aspect of the flights. Once past the Tropopause, external temperatures actually begin to increase again. This is a result of the incoming solar radiation heating the payload faster than it can dissipate it. For high power payloads such as voice repeaters, this brings yet more interesting design challenges,

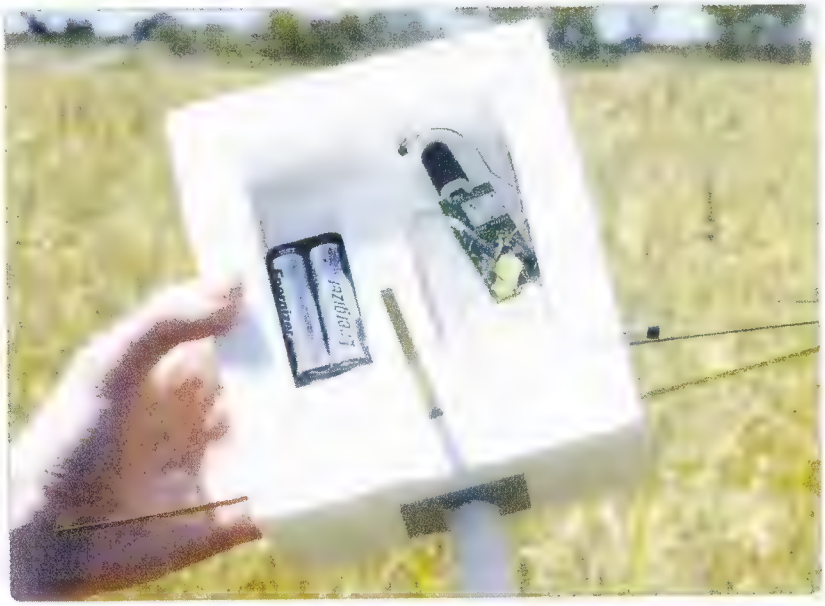


Figure 7: Completed 70 cm RTTY telemetry payload.

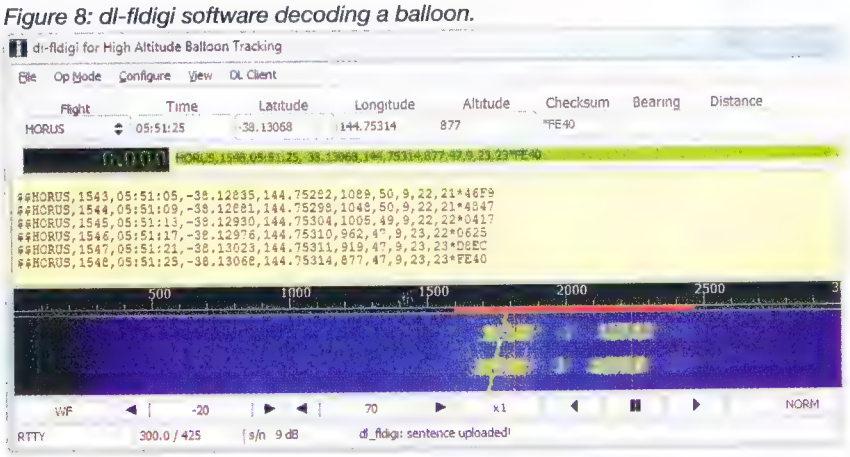
and is another of the many quirks observed when flying the balloons.

Producing and broadcasting the telemetry is only part of the tracking solution. It is important that all of the data is collected for later analysis. To achieve this, Project Horus relies on having multiple ground stations receiving, decoding and then pooling the data into a common database via the Internet. To support this, a software package called 'dl-fldigi' is used to collect and send data into the database called Habitat. Each receiving station then only needs a 70 cm SSB receiver tuned to the beacon and to then have it attached to the PC's sound card. (You can see the resulting telemetry being decoded in Figure 8.)

To complete the chain, each station then needs to enable the 'send to Internet' function in the software. The data collected can then be shared with the online database at *spacenear.us/tracker*. This website not only collects and stores the data, but actively uses it to predict in real time the estimated landing zone for the flight, presenting the result for all to see.

The chase cars can also access that data via 3G cellular Internet links. These, in addition to their own telemetry receive systems, forms part of the information used to locate and recover the payload

Figure 8: dl-fldigi software decoding a balloon.



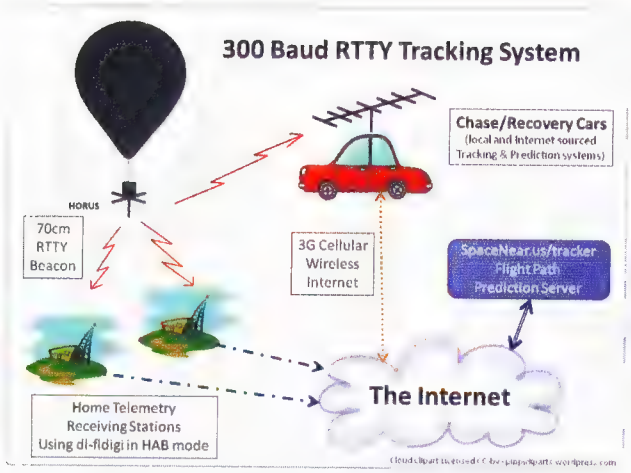

300 Baud RTTY Tracking System
Chase/Recovery Cars
(local and Internet sourced Tracking & Prediction systems)
HORUS
70cm RTTY Beacon
3G Cellular Wireless Internet
SpaceNear.us/tracker Flight Path Prediction Server
The Internet
Home Telemetry Receiving Stations Using dl-fldigi in HAB mode

Figure 9: Telemetry decoding network.

successfully. At times, the balloon teams rely very heavily on the distributed listener network and the Internet feed, as mobile flutter and fading can make direct balloon decoding difficult while driving. In this way, amateurs listening and uploading data from across the balloon's footprint can contribute directly to the success of the flight!

A complete picture of the flight tracking system can be seen in Figure 9.

APRS backup telemetry beacon

Project Horus has experimented with flying AX.25 1200 baud APRS beacon payloads since Horus 9. The very first attempt at APRS used a TinyTrack3 from Byonics. Being new at balloon-based APRS, a couple of mistakes were made - not the least of which was the setting of the wrong digipeater path. (The subject of APRS paths for balloon experiments is a controversial topic best left for a later article.) It also required a large number of batteries, had an output power of over one watt and was heavy in comparison to the primary telemetry. Notwithstanding these problems, this first APRS tracker experiment was a resounding success, and paved the way for future flights.

Following Horus 9 Matthew VK5ZM set to work developing an alternative tracker, built upon the Micronut flight computer already used for RTTY. He added a new power subsystem, radio module and firmware; the end result being a smaller, light-weight 300 mW APRS beacon for 145.175 MHz. This version was able to be powered for in excess of 24 hours by a pair of AA lithium batteries.

The main advantage of the APRS system was that it provided a complete backup telemetry system for the flights without additional infrastructure. Using the existing national APRS network means it is possible to take advantage

Figure 10: SpaceNear.us/tracker plots of Horus 26 and 27 flight paths. Mapping courtesy Google Inc.

of the existing repeaters and I-Gates across SE Australia. APRS also provides the chase teams with an independent tracking receive system. The teams use radios such as the Kenwood D710 and D72 to directly obtain range and bearing information to the balloon.

Amateurs across the world can also follow the flight on the various APRS mapping packages found on the Internet. For those living in the coverage footprint, direct reception and plotting on your own APRS software packages is quite feasible. The new balloon orientated features on *aprs.fi* now plot the balloon's radio horizon, making it easier to observe the balloon's coverage area relative to your listening station.

In addition to standard APRS position data, the current generation APRS beacon is also capable of sending telemetry data. This is used to report battery voltage, internal and external temperature and the number of GPS satellites being received. *Aprs.fi* can decode this data and display it graphically in real time; giving amateurs even easier access to information on how the flight is going. See Figure 12.

Payloads and Experiments

Apart from the fun that has been had just building and flying a trackable high altitude balloon platform, there is of course a more interesting side to the project. So far, Project Horus has flown a multitude of different payloads for different groups around the country, as well as its own experiments. Here are but a few of them.

Cameras - stills and video

Various camera payloads have flown to date. These flights always yield some of the more 'stunning' images generated by the project, because let's face it, who doesn't want to obtain their own photos and videos of the world from 'near' space!

Figure 11: APRS plotted balloon track via the aprs.fi website. Mapping courtesy Open Street Maps.

VK5ARG-11 center zoom info
2012-05-26 23:34:56z
100 km/h 83° alt 12687 m
Telemetry 2012-05-27 02:19:50z. show telemetry
Battery: 1350 mV, IntT: -1 degC, ExtT: 6 degC, NumSat: 12 sats
http://projecthorus.org/
[APZ001 via WIDE2-1,qAR,VK3WRM]
being tracked - stop tracking - track in Street View
VK5ARG-11
VK3RBT-3

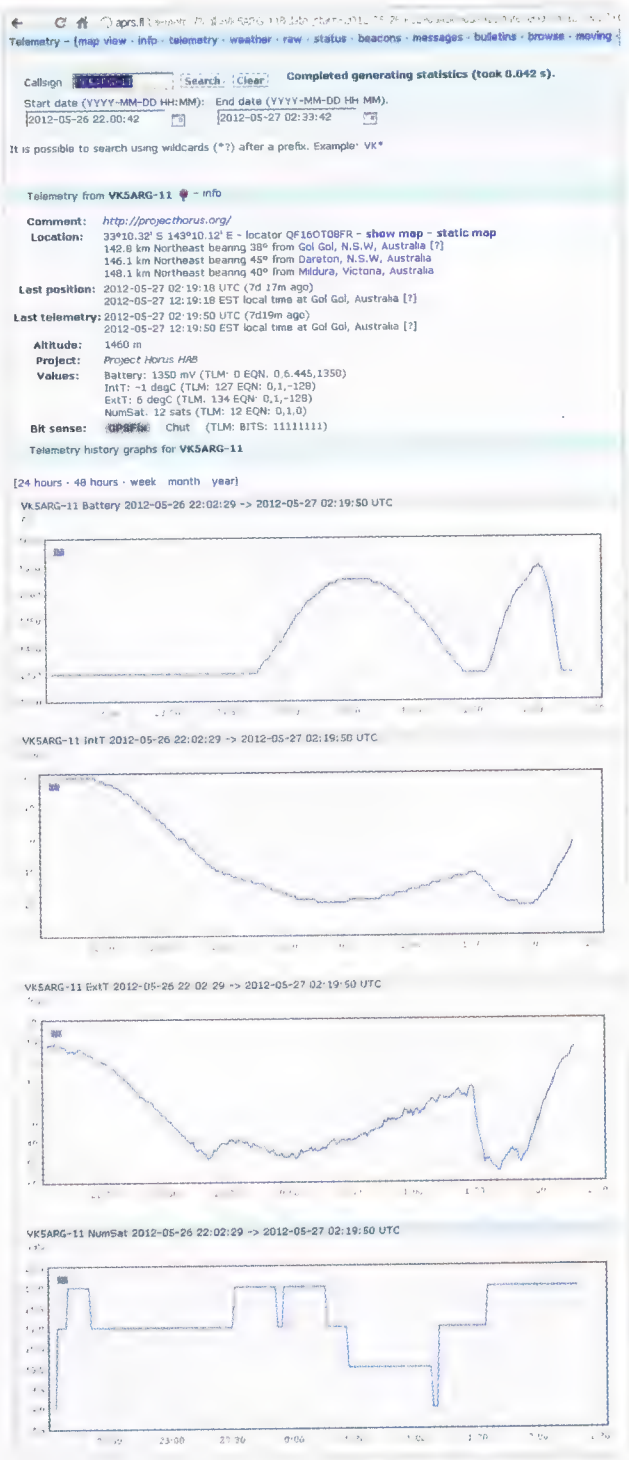

Telemetry - (map view · info · telemetry · weather · raw · status · beacons · messages · bulletins · browse · moving)
Callsign
Search
Clear
Completed generating statistics (took 0.042 s).
Start date (YYYY-MM-DD HH:MM):
End date (YYYY-MM-DD HH:MM).
2012-05-26 22:00:42
2012-05-27 02:33:42
It is possible to search using wildcards (*?) after a prefix. Example: VK*
Telemetry from VK5ARG-11 - info
Comment: http://projecthorus.org/
Location: 33°10.32' S 143°10.12' E - locator QF16OT08FR - show map - static map
142.8 km Northeast beanng 38° from Gol Gol, N.S.W, Australia [?]
146.1 km Northeast beanng 45° from Dareton, N.S.W, Australia
148.1 km Northeast beanng 40° from Mildura, Victoria, Australia
Last position: 2012-05-27 02:19:18 UTC (7d 17m ago)
2012-05-27 12:19:18 EST local time at Gol Gol, Australia [?]
Last telemetry: 2012-05-27 02:19:50 UTC (7d19m ago)
2012-05-27 12:19:50 EST local time at Gol Gol, Australia [?]
Altitude: 1460 m
Project: Project Horus HAB
Values: Battery: 1350 mV (TLM: 0 EQN. 0,6.445,1350)
IntT: -1 degC (TLM: 127 EQN: 0,1,-128)
ExtT: 6 degC (TLM. 134 EQN: 0,1,-128)
NumSat. 12 sats (TLM: 12 EQN: 0,1,0)
Bit sense: 0P8Fix Chut (TLM: BITS: 11111111)
Telemetry history graphs for VK5ARG-11
[24 hours · 48 hours · week month year]
VK5ARG-11 Battery 2012-05-26 22:02:29 -> 2012-05-27 02:19:50 UTC
VK5ARG-11 IntT 2012-05-26 22:02:29 -> 2012-05-27 02:19:50 UTC
VK5ARG-11 ExtT 2012-05-26 22:02:29 -> 2012-05-27 02:19:50 UTC
VK5ARG-11 NumSat 2012-05-26 22:02:29 -> 2012-05-27 02:19:50 UTC

Figure 12: APRS telemetry output on aprs.fi

The camera of choice for most of the HD video flights has been the GoPro HD Hero. This little camera weighs just 94 grams but records HD Video at 1080p resolution, perfect for suspending below a balloon.

Probably one of the most memorable flights was that of Tux the Penguin. Tux is the mascot for the Linux operating system. The flight was Horus 14, and

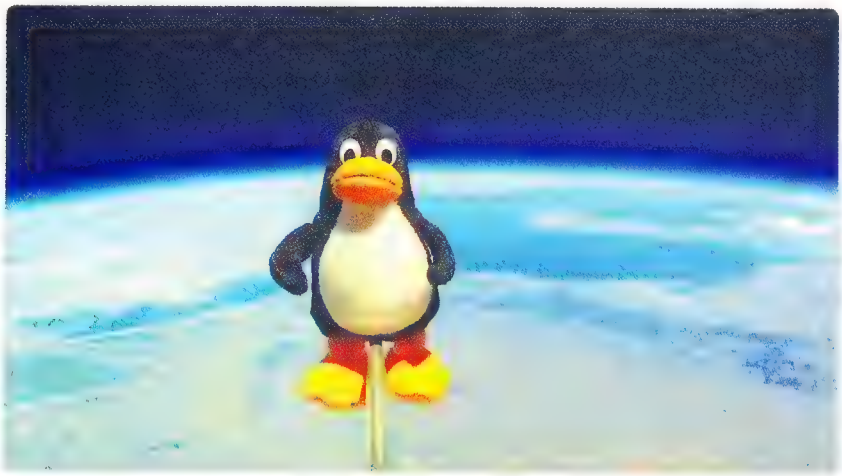


Figure 13: Tux the Penguin flying over South Australia on Horus 14.

occurred right after the Queensland flood disaster of 2011. Since the Australian Linux Conference was being held in Brisbane just after the flooding, the team hit upon the idea of auctioning off a photo of Tux signed by the conference keynote speakers (Linus Torvalds, Vint Cerf, Geoff Huston and others) plus the actual Tux that flew for charity. Over $23,000 dollars was raised for the Queensland Premier's Flood Appeal.

Repeaters - Simplex and cross-band

Another popular payload has been the flying 'airborne' repeaters. The first of these was a simplex parrot repeater on Horus 6. It worked by connecting a digital voice record/playback device to a two metre radio using an Arduino microcontroller. Whatever the parrot repeater heard within a 10 second window was repeated back after the squelch closed. Not the most efficient method of communication but certainly effective. On that first flight, 22 stations from VK5 and VK3 made contact through this system.

The parrot repeater incidentally also taught the Project Horus team a valuable lesson about batteries. During its second flight on Horus 9, it became clear that not all lithium batteries work in extreme temperatures. The LiPO battery used to power it on that occasion literally froze, resulting in the failure of the system at ~ 10,000 metres altitude.

Horus 9 was also the debut of another new repeater payload. This flight carried aloft a cross band 70 cm/2 m FM voice repeater, which was constructed by Adrian VK5ZSN. The core of this system comprised two Motorola GP68 handhelds that were stripped bare to reduce weight and held together with hot melt glue and cable ties. It was powered using six AA Lithium batteries. The payload used 'Slim Jim' antennas made from 300 ohm TV ribbon cable to save weight. The final output power was ~one W on two metres. On receive, access was controlled via the use of a 123 Hz CTCSS tone.

This payload has proven that 'antenna height is everything' when it comes to repeater coverage. At apogee, range of the repeater is estimated to be 760 km. During the recent Horus 26 WIA AGM flight, over 120 contacts were logged via this repeater.

Whenever the group flies the repeaters, it also endeavours to arrange for a net control station. This is to allow as many stations as possible to make contact through the repeater. Special thanks must be extended to all of the volunteer net control operators that have assisted with every flight.

Payloads for other groups

It was recognised early on that the project's balloon launch capabilities and location would be of interest to other groups around Australia. As such, several flights have been made for groups including the University of Adelaide and University of Sydney Rocketry Club.

In short, if you or your club have an idea, then the team is more than happy to discuss this with you.

Figure 14: 2 m/70 cm cross-band repeater.

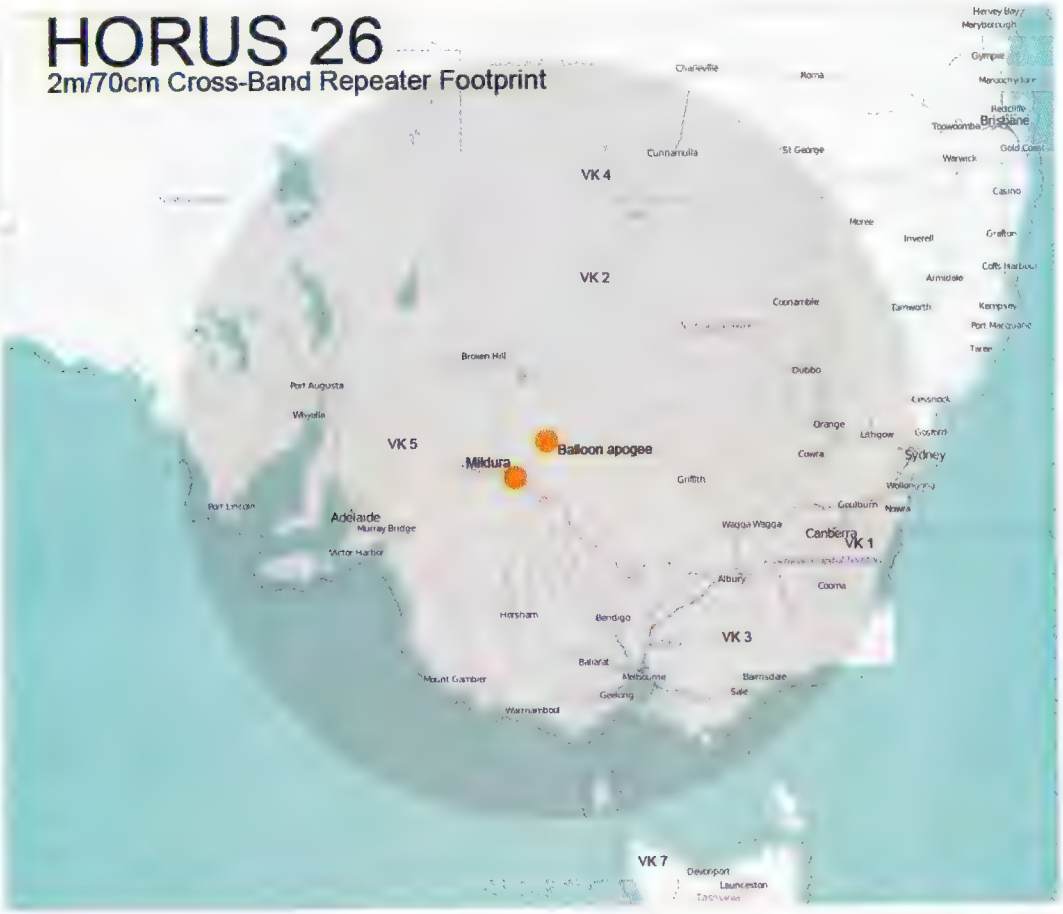


Figure 15: Estimated 2 m/70 cm cross-band repeater footprint at 35 km altitude. Mapping courtesy Open Street Maps.

Flight chase and recovery operations

The final chapter of any flight is to chase and recover the payloads after the balloon has burst. The project team's chase vehicles have evolved through the life of the project into quite complex systems.

Each of the teams has a RTTY telemetry receiver and is using the fl-digi software to decode the data and upload it to the Internet over 3G Cellular. This RTTY data is also used to feed the offline flight path predictor (in-house software) which interfaces with the OziExplorer mapping software.

Most teams also have an APRS receiver to listen to the backup telemetry. As a last resort, the teams are also equipped with RDF equipment to track the beacons by hand should the telemetry become too weak to decode or corrupted by some other systems failure. Inter-team communications equipment is also included. Each car is equipped with combinations of HF, two metre and 70 cm radios to cover all situations.

Many challenges have been faced in making all of these systems work together harmoniously. The story of these systems, however, is

Figure 16: Adrian VK5ZBR and Rod VK5UDX - Horus 9 Net Control.

Figure 17: Paul VK5BX and Graham VK5GH - Horus 23 Net Control.

a long one and will be the subject of a future article!

Thank You!

It is also worth noting that the teams would have far less success if it wasn't for the multitude of amateurs across SE Australia that assist on each flight collecting the telemetry, and uploading it to the Internet. To those people, Project Horus would like to say a big thank you!

A very special thank you is also required for Graham VK5GH and Carol VK5ZCH. They have graciously hosted the majority of the project

Figure 18: Typical team chase cars (VK5ZM & VK5ZSN).

Project Horus Launch History

Payload name	Status	Launch date	Altitude	Flight time	Description
Horus 1	Recovered	5/02/2010	29,606 m	Approx. 2 h	Initial launch, 2 cameras
Horus 2	Recovered	8/03/2010	1,479 m	Approx. 1 h	Unsuccessful launch
Horus 3	Recovered	8/07/2010	32,718 m	Approx. 3 h	High baud rate telemetry test
Horus 4	Recovered	16/07/2010	14,413 m	Approx. 2 h	High baud rate telemetry test
Horus 5	Recovered	24/08/2010	31,180 m	Approx. 2 h	Collaborative launch with USYD
Horus 6	Recovered	28/08/2010	34,297 m	Approx. 3 h	Simplex radio repeater flight
Horus 7	Recovered	29/08/2010	35,354 m	Approx. 3 h	Camera (video & still) flight
Horus 8	Recovered	9/10/2010	32,101 m	Approx. 7 h	HF Telemetry, HD Video
Horus 9	Recovered	23/10/2010	34,205 m	Approx. 3.5 h	APRS beacon, Cross band repeater, Simplex Repeater
Horus 10	Recovered	15/11/2010	17,385 m	Approx. 3.5 h	Offline predictor test launch
Horus 11	Recovered	21/11/2010	33,708 m	Approx. 3.5 h	HD video launch (Jason Hansma - Hermes)
Horus 12	Recovered	23/11/2010	33,773 m	Approx. 2.5 h	Stills, HD video launch (Lonely Planet)
Horus 13	Recovered	4/01/2011	31,107 m	Approx. 3 h	HD video launch (Camera Launch)
Horus 14	Recovered	18/01/2011	30,209 m	Approx. 2.5 h	HD video launch (Linux.conf.au Launch - Tux Penguin)
Horus 15	Recovered	26/02/2011	20,290 m	Approx. 2 h	HF telemetry, HD video
Horus 15.5	Sacrificed	20/08/2011	40,575 m	Approx. 5 h	Altitude record attempt - UK Launch
Horus 16	Lost	18/09/2011	38,807 m	Approx. 24 h	Altitude record attempt
Horus 17	Recovered	16/10/2011	9,303 m	Approx. 40 m	'Pico' payload test
Horus 18	Recovered	13/11/2011	33,243 m	Approx. 3 h	HD video, APRS, (Yoyoshop Launch)
Horus 19	Recovered	27/11/2011	33,588 m	Approx. 3 h	HD video, APRS, (Skipping Girl Vinegar Monkey)
Horus 20	Sacrificed	17/01/2011	22,040 m	Approx. 1.5 h	Linux.conf.au launch #1 Pico Launch from Ballarat
Horus 21	Recovered	20/01/2012	20,863 m	Approx. 2.5 h	Linux.conf.au launch #2 Pico Launch from Ballarat
Horus 22	Lost	14/03/2012	37,113 m	Approx. 4 h	Network 10 (Scope-TV) launch
Horus 23	Recovered	15/04/2012	35,376 m	Approx. 3 h	X band rptr, APRS & uplink testing for WIA Field Day
Horus 24	Recovered	8/05/2012	13,625 m	Approx. 2 h	Uplink & Termination Test #1
Horus 25	Recovered	20/05/2012	31,360 m	Approx. 4 h	Uplink & Termination Test #2
Horus 26	Recovered	27/05/2012	35,449 m	Approx. 4.5 h	Cross Band Repeater, APRS @ WIA AGM Launch Mildura
Horus 27	Recovered	27/05/2012	36,732 m	Approx. 3 h	HD Video and Stills Launch @ WIA AGM Launch Mildura

Table 1: Project Horus flight history to May 2012

Figure 19: Balloon landing (Horus 7).

team's balloon launches from their carport and front paddock. Your support for the project has been above and beyond and is genuinely appreciated by every team member, especially Carol's hospitality with tea, coffee and homemade biscuits.

Project Horus - where to from here?

So, that's the Project Horus journey to date. The project team has so far had a lot of fun flying these unique experiments, and hopes that others have enjoyed watching and participating too! It is worth mentioning that this still is really only the beginning, we've a lot more ideas for future payloads and experiments we wish to try.

So keep an ear out for some of the future experiments that the group is considering, that include live ATV transmissions, more scientific payloads, distance and height record attempts and loads more imaging payloads. One thing you can also be sure of, amateur radio will play an integral part along the way!

Horus Telemetry Tracking Honour Roll

Project Horus would like to thank all of the amateur radio operators across SE Australia who have tracked our flights over the last two years and uplinked data to the Internet.

ACT: VK1KW
NSW: VK2AWJ VK2HRX VK2KAW
VIC: VK3ALB VK3AMZ VK3HGI VK3NFI VK3SI VK3SMC VK3VCL VK3VFO VK3YFL VK3ZYC
SA: VK5ACY VK5AKH VK5AKK VK5ALX VK5AW VK5AWP VK5BWR VK5CP VK5CV VK5DJ VK5DK VK5DMC VK5EE VK5EU VK5EX VK5FDRK VK5FMLB VK5FPAW/3 VK5FSCK VK5GH VK5KK VK5KX VK5LA VK5LY VK5NE VK5NEX VK5NG VK5NIG VK5NRG VK5OI VK5PJ VK5QI VK5VCO VK5VZI VK5ZAI VK5ZD VK5ZEA VK5ZM VK5ZPS VK5ZRL VK5ZSN VK5ZT

Table 2: Horus telemetry tracking honour roll.

Figure 20: Graham VK5GH - one of the Project's major supporters.

If you would like more information?

If you would like to learn more about Project Horus, it's past flights, how to track the balloons or receive warning about future activities then please take a look at the Project Horus website *http://www.projecthorus.org/*

Video documentaries about the project are also regularly uploaded to the project's Vimeo web TV channel. You can find this at *http://www.vimeo.com/channels/projecthorus* If you capture some film of a Project Horus event, why not upload it to Vimeo directly and let us know so we can add it to the channel as well!

Onwards, upwards and happy hunting!

Figure 21: Horus 23 recovery team.

VK4ILH Cape Moreton Lighthouse AU0009, Moreton Island IOTA OC-137, ILLW 2012

Derek Toreaux VK4MIA, Team Leader VK4ILH

Photo 1: Cape Moreton Lighthouse viewed from the water.

Cape Moreton Lighthouse, on Moreton Island, off the south east coast of Queensland, will be activated for the first time for the ILLW by a team of eight operators who will undertake a DXpedition style activity for ILLW 2012.

With the experience of three returning members from the VI4FI activation of Sandy Cape on Fraser Island last year it was decided that the ILLW team this year would be a larger contingent of operators. As per the previous year, we contacted the Queensland Parks and Wildlife Service (QPWS) and submitted our interest in making a return trip to Sandy Cape for two years running and putting VI4FI back on the air again on a much larger scale for this year. Unfortunately, due to QPWS not having an available time slot on their schedule for us, our application was quickly declined, dashing the hopes of the growing team.

With morale fairly low within the team, it was decided to push forward and not let this spoil our plans for ILLW 2012. After a discussion with Co-Team Leader Paul VK4FPDW it was decided that we try for something that had not been done for a number of years.

Cape Moreton topped the list in VK4, with only one previous listed activation, in 2007 by then VK4HAM (now VK4NM). Since I had known Andrew for quite a number of years, I dropped him an email to get his mobile number to ask about his activity at Cape Moreton and as to whether he had a contact number for one of the Rangers based on Moreton Island. As it turns out Andrew's response was 'mate, I never went', so with that it was back to searching for which QPWS office would be in charge of operations on Moreton Island.

After a brief search, the Manly Office came up as a contact point for Moreton Island and without any delay I picked up the phone and after a few brief moments explaining my reason for calling, the young lady gave me a contact number for the Ranger on Moreton Island... wow, too easy!

About a week or so had passed and, thinking the worst, I was tempted to call the Ranger again and leave another message but didn't want to seem pushy. Towards the end of my lunch break at work my phone rang and to my surprise and delight it was Ranger Terry Christensen from the QPWS on Moreton Island calling, curious as to why I had contacted him. After briefly explaining who I was, what we had achieved the previous year and what we would like to do this year on Moreton Island, he was more than attentive and asked me to email him our plans and also what took place at Sandy Cape last year so they could 'get a feel' for what we were about. That night I put together a very detailed email including the article in *AR* magazine that featured in the October 2011 issue, website links, photos and so on, to which Terry promptly replied the next day and said we would hear back from someone in due course.

However, one week turned into two weeks, three weeks into four...eight weeks went by, and I thought the worst again, so dropped Terry a quick email asking about the application and whether any decision had been made as our team was starting to run out of time. He quickly replied and thought that somebody has already been in contact with me but alas, no. After giving Terry my home number to contact me, the phone rang not long after 9 am on the Friday morning. The discussion we had certainly put a smile on my face as I heard the words 'we really support what you guys are doing and we want to accommodate the team as best we can'. All they requested from us was

Photo 2: A closer view of Cape Moreton Lighthouse showing some of the infrastructure immediately adjacent to the light.

final dates, times and number of people in our team, also where we wanted to set up our antennas and operating stations.

At this stage we had seven definite operators for the team but as an added extra we wanted to add something special for the amateur community with a lone CW operator as part of our team for 2012. We had three operators in mind but two of them were interstate and only one local. After a discussion with Ewan VK4ERM he suggested I contact our local operator as he was keen on CW and would probably like to join the team; with that in mind I did just that but due to work commitments our only local CW operator could not join the team. So I went out on a limb and sent one of the interstate CW operators an email inviting him to join the team as we were only about a week or two away from approval for Cape Moreton. To my surprise the response was a 'yes! I would like to do that as I have never been to Moreton Island before' – this being Luke VK3HJ, our eighth and final member of the team.

Now that the team was complete another email was forwarded to Terry at the QPWS with final numbers and noting the fact we now had an interstate guest joining us and flights would need to be booked ASAP so could they please take this into consideration with our formal approval. Within four days I received the email that we had all been waiting for, approval for team VK4ILH to operate from Cape Moreton Lighthouse! With an adrenaline rush I quickly composed an email for the entire team while on my break at work to let them all know of the good news; in addition dropping Terry an email as well to quickly ring me to verify what I was reading was correct...you simply couldn't wipe the smile from my face.

Two days later, after unveiling the website, Facebook and Twitter profiles, I received in the mail the formal letter of approval from Andrew Hoffman 'Operations Manager' at QPWS Branch at Manly outlining everything that had been discussed in the weeks leading up to this point. This was scanned and emailed out to the entire team and also displayed proudly on our website. Cape Moreton 2012 was 'Go!'

Our last step in making everything complete was to again contact Dave Tavener VK4ICE (VK4ICE Communications) as he made mention that he'd love to again support our venture in 2012 as he had done in 2011. Paul VK4FPDW contacted Dave regarding an issue which hampered Sandy Cape the previous year; internet access. So this year Dave will be supplying Team VK4ILH with 3G Yagi antennas so we can still have contact with the outside world, as well as the Butternut HF6V multi-band vertical which Dave donated to the team last year for VI4FI.

Other antennas being used for Cape Moreton 2012 will be a three band Spiderbeam for 10, 15 and 20 courtesy of John VK4IO and Catherine VK4GH. For the lower bands we will use a combination of the Butternut and a full sized 80-10 dipole (similar to a full sized G5RV). We will be operating up to three bands at once, which will give everyone an opportunity to work us either on SSB or CW, depending on propagation.

The team for VK4ILH Cape Moreton Lighthouse AU0009, Moreton Island IOTA OC-137 is Derek VK4MIA, Paul VK4FPDW, Brooke VK4MBL, John VK4IO, Catherine VK4GH, Ewan VK4ERM, Graham VK4GRA and last but certainly not least, Luke VK3HJ.

The date of operation will be from Friday 17th August until the morning of Monday 20th August, which will include the entire 48 hours of the International Lighthouse & Lightship Weekend. Further information and updates will be available on the website at *www.capemoreton2012.com* or via social media networks on Facebook and Twitter.

2012 marks the 155th anniversary of the Cape Moreton Lighthouse, which was the first lighthouse built in Queensland, in 1857. This DXpedition also marks the first time that Cape Moreton Lighthouse has been activated in the history of the ILLW. Although Moreton Island OC-137 is not a 'Most Wanted' IOTA it has not been active in almost 15 years! Last recorded activity was in 1998.

We look forward to working as many Lighthouses and Lightships within VK/ZL and around the world, not forgetting the WLOTA and IOTA chasers as well. CU on the bands!

Editor's Note: It is not intended to publish articles announcing upcoming ILLW activations. This article has been published because it describes the detailed planning required for the activation. There will be many other VK stations planning to participate in the ILLW – as at 3 June, the illw.net website shows 45 lighthouses registered. Further details of the ILLW can be found at http://illw.net/ Readers should note that the ILLW was founded by the Ayr Amateur Radio Group (AARG). Another group exists, based in the US, which also promotes lighthouse activations. The US group and its activities are not part of the AARG sponsored activities.

Magnetic loop for HF pedestrian mobile

Peter Parker VK3YE
w www.alphalink.com.au/~parkerp

All practical HF mobile antennas involve some compromise. The trade-offs are especially severe for the pedestrian mobile operator, who must carry the entire station (including antenna) by hand. This may explain the low amount of pedestrian mobile activity despite suitable transceivers being widespread.

The author's first pedestrian mobile antenna was a base-loaded 1.5 metre whip, similar in concept to the commercially-available 'Miracle Whip'. Performance was adequate for its weight but still insufficient for reliable results on 40 metres.

The next attempt was a one metre diameter magnetic loop made of RG213 coaxial cable encased in ribbed tubing supported on a broom stick. Performance was excellent, but it was too heavy to comfortably carry, defeating its purpose.

The antenna that proved just right is described here. A lighter (and compromised) version of the first loop, it can be carried with ease and covers 7, 14, 18, 21, 24 and 28 MHz. Efficiency is higher than the whip and results have been pleasing, even on 40 metres. Construction cost is around 20 dollars.

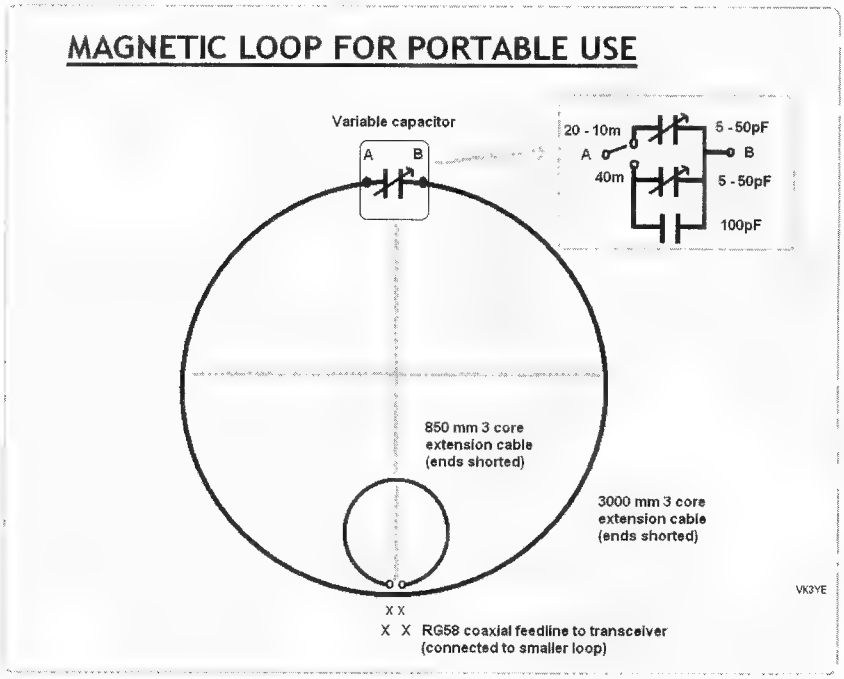


Figure 1: The pedestrian mobile magnetic loop.

Obtaining the parts

All parts (except the capacitors and optional switch) are available from hardware stores. A list is provided below:

- 1 three core mains extension cable x 3 metres
- 1 three core mains extension cable x 0.85 metres
- 1 RG58 coaxial cable x 3 metres
- 1 PL259 or BNC plug to suit transceiver
- 1 9.5 mm timber dowel x 225 mm (see text)
- 2 9.5 mm timber dowel x 450 mm (see text)
- 1 9.5 mm timber dowel x 1030 mm (see text)
- 2 irrigation tubing cross-piece
- 5 irrigation tubing tee-piece
- 2 5 – 50 pF variable capacitor (see text)
- 1 100 pF mica capacitor (see text)
- 1 SPDT toggle switch (see text)
- 1 small plastic box
- cable ties and tape

The capacitors are the hardest to find and you may have to make substitutions. I used beehive trimmers that can be finely adjusted by hand. These came from VHF low band FM transceivers and have a maximum capacitance of 50 pF, usefully allowing 14 – 28 MHz coverage. 7 MHz requires 100 pF more capacitance to be switched in, and as it is the most used band I included a separate variable capacitor for it.

There are several things you can do if you do not have 50 pF beehive trimmers. 25 pF trimmers are more common and are fine for the higher HF bands. Depending on the size of the loop two in parallel may be needed for 14 MHz.

Compression-type mica trimmers may work but are harder to adjust. However they should be acceptable for fixed frequency loops. Anything smaller, for example, plastic trimmers, should be avoided as they may not handle the high voltages present, even at low transmit powers.

A small air spaced variable capacitor will also work, though a reduction drive is desirable for accurate tuning. If it has a maximum capacitance of at least 150 pF you will not need the switch or the 100 pF parallel capacitor for 7 MHz. The other advantage is continuous coverage, including 10 MHz.

Larger dual gang air spaced variable capacitors are also suitable but heavier. These have

a maximum capacitance around 400 pF. To reduce losses both capacitors should be wired in series by leaving the frame unconnected and connecting each end of the large loop to each gang. If these capacitors have trimmer capacitors on their frame either set them to minimum or, preferably, remove them. This will lower minimum capacitance and improve coverage of the higher HF bands. If ten and twelve metres still cannot be covered you may need to make the loop smaller to resonate.

If all else fails you will need to make your own capacitor, which is after all just two conductive surfaces separated by air. Possibilities include use of tin plate, copper tube, circuit board material and/or coaxial cable. If you are still stuck making several single or dual band loops may be easier than a wide band loop such as this one. This is probably more efficient anyway, especially if you can make the 40 metre version larger.

Construction and testing

Construction takes a couple of hours. The antenna comprises two loops. The large loop is tuned to the operating frequency. A smaller loop couples it to the transceiver. A light frame of irrigation fittings and snugly fitting timber dowelling supports both loops. The fit is tight enough not to fall apart but loose enough to be dismantled when not in use.

The large loop's dimensions are not critical except for having to resonate in all desired bands with the variable capacitor at hand. Three metres of three core extension flex, with the wires soldered together at both ends, was used in mine. The coupling loop is made of similar cable but is smaller, a quarter to a fifth the larger loop's diameter. It is mounted at the bottom of the loop, furthest from the variable capacitor.

Make the loop before its support to ensure its dimensions are right for the desired frequency range. Start with a longer length and cut down until you reach a length that resonates on 10 metres near minimum capacitance. I found 3 metres satisfactory for 28 MHz SSB but too long for the 29 MHz FM segment. The smaller loop is less critical. For both loops the ends of all three leads inside the cable are stripped and soldered together – having these in parallel lowers resistance and losses.

Photo 1: The magnetic loop in use. AR recommends that you do not operate in this manner – use a mast to increase the distance between yourself and the antenna.

Small pieces of circuit board material were used to more firmly mount the variable capacitors and join the coaxial feedline to the smaller loop. Note that the larger loop is not connected at all to the feedline but its proximity to the smaller loop allows efficient coupling between them.

Suspend the frameless loop with string from a tree or similar so that it forms a square diamond, you may need to use a spacer to keep it open. Temporarily string and tape the smaller loop so that it is inside and in the same plane as the larger loop and does not flop around. The variable capacitor should be at the top with the feedline at the bottom.

With a general coverage receiver or transceiver tune to various HF amateur bands and the loop's variable capacitor for maximum noise received. The peak should be fairly sharp – this reflects the loop's

Photo 2: A close look at the magnetic loop.

narrow bandwidth. If you cannot obtain a noise peak for a band, most likely 10 or 40 metres, as these are at either end of the range, the loop and/or capacitor values are either too large or too small. If these bands are important, make the loop and/or capacitor smaller (10 metres) or larger (40 metres) to resonate.

VSWR can be checked with a transceiver set to five watts and a VSWR meter. It should read a low value near the loop's resonant frequency. However it rises rapidly when the frequency is moved. This narrow bandwidth means that you may need to retune the loop if you're changing frequency by more than a few tens of kilohertz. Test VSWR in all bands the loop covers.

Make the frames for both loops once you are happy with frequency coverage. This comprises dowelling cut to a size that allows a snug fit but easy assembly. Irrigation cross and tee pieces form the mounting brackets, while tension from the loop holds it all together. The dimensions I used appear in the parts list above.

It is possible to mount a loop onto a backpack, but I kept mine hand held. The loop is light enough to be carried for long walks and holding it allows better control of direction – important as the antenna is directional. The transceiver and battery fit in an over-the-shoulder bag from a discount store. Get one with separate compartments to fit the battery, transceiver and accessories. To keep things neat it is sometimes helpful to make a hole between compartments to take the power lead.

(All amateurs need to keep in mind the potential dangers posed by exposure to electromagnetic fields. Even if you are only operating at 5 W PEP on SSB, one should always ensure that all body parts of all persons, including the operator, are a safe distance from the antenna. Always assume a worst case scenario until you have done the calculations or used an appropriate tool to determine the exclusion distance for the power, mode and antenna in use. Using the VK3UM Site Radiation (EMR) Calculator, with a 5 W carrier on 14 MHz, the on-axis exclusion zone is 0.53 m for a half wave dipole. Whilst the loop described here will be less efficient than a dipole, one should take a conservative approach. Operating the loop hand-held, as described by the author, is NOT recommended. Ed.)

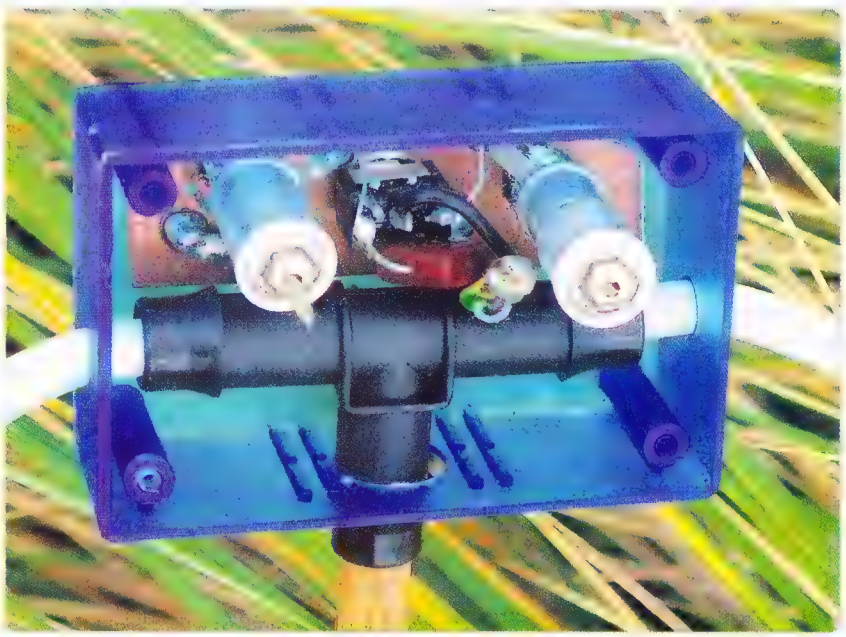


Photo 3: A close up of the capacitor box.

Photo 4: A close up of the coupling loop.

Results

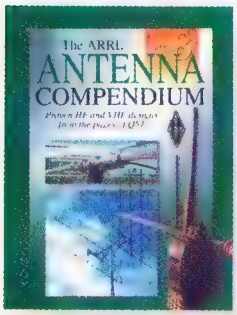
The loop has delivered excellent results, especially on ten metres. On that band solid contacts have been made with the USA, South Africa and around Australia and New Zealand. Efficiency falls on lower bands, but solid contacts around VK/ZL are still possible. 20 metres is a bit hit and miss due to the band's DX orientation. When conditions are good 17 metres can be a good refuge and provide some high quality contacts.

As would be expected, performance is least on 7 MHz. Due to its compromises, performance was about 7 dB down on a similar sized (but heavier) loop using RG213 coaxial cable. Compared to a G5RV it is about 20 dB down. These tests were tested on a path to VK7 using reports from WSPR. Nevertheless good 7 MHz contacts have been made up to about 500 – 600 km but the station worked needs to have a quiet receiving environment.

Conclusion

Described has been an antenna that will get you started in the exciting world of HF pedestrian mobile, which is open to all licence types. You will get some funny looks but the rewards are great; DX will become increasingly common with rising sunspots in the next few years and in many cases contacts will say you are their first pedestrian mobile contact. Demonstrations of this antenna can be seen on the author's YouTube channel at *www.youtube.com/vk3ye*

Photo 5: A close up of the feedline connection.



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A squid pole antenna mast

Richard Cortis VK2XRC

Photo 1: System components.

This is a suggestion for a simple, quick and easy VHF/UHF antenna mast for portable operation. All that is needed is a suitable antenna such as a Diamond or similar which has a short aluminium tube support for the base, the antenna feed line, and a seven metre or similar squid pole.

To erect the mast, pull the rubber bung out of the top, unscrew the cap from the base of the squid pole and withdraw the two top sections so that the top of the remaining section is large enough to pass the PL259 connector. You may need to remove the rubber knob on the top of the top section to be able to withdraw it satisfactorily. I suggest that you use at least a ten metre long feed line because you will need five metres to go up the mast. It is easier to slide the end of the co-ax feed line up the squid pole before you start erection. Run the cable out straight so it does not get kinked. Slide the aluminium tube mount over the feed line and the top of the squid pole. With the feed line fed up the squid pole, connect it to the base of the antenna and then slide the aluminium tube antenna support base onto the bottom of the antenna and do up the retaining screw or bolt. Slide the antenna onto the top of the squid pole and then erect the squid pole. Tie off the squid pole to something firm. Connect the feed line to the radio and away you go.

Try not to lose the rubber tip, the two top sections from the squid pole, the rubber plug for the top or the plastic and rubber base cap so that you can put it all back together when you are finished. You can either guy the mast with some venetian blind cord or bricklayers' twine or fix it to your tent post or a fence post with an electrical tie or two.

The system is useful for a quick portable set-up where you plan to move on. If it is windy or you plan to be there for a while, ensure that the sections are firmly engaged.

If you are sensitive about scratching your squid pole, you can wrap some insulation tape around the squid pole at the bottom of the aluminium support tube to provide some resistance to chafing.

Have fun operating portable!

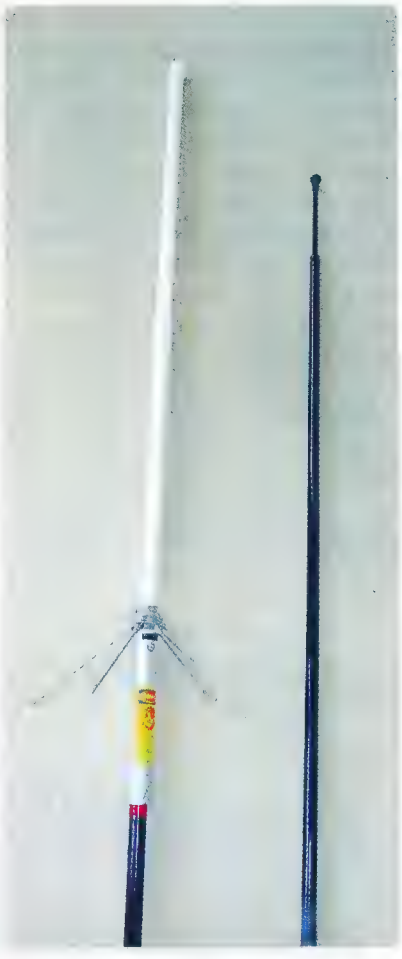

Photo 2: Final assembly.

VHF/UHF - An Expanding World

David Smith VK3HZ
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Weak Signal

The main activity of any note for the month involved the Eta Aquarids meteor shower. Adrian VK4OX was heavily involved with the northern end of the VK4 to VK3 path and reports:

The Eta Aquarids (EA) for 2012 once again proved a very reliable source of 144 MHz, two way SSB QSO's over the VK4-VK3 path. The OH5IY Meteor Scatter Predictor program stated 'The EA meteor shower peaks on 2012-05-05 at 1900Z. Above half max eight days. Prediction has accuracy of ± 48 hours. ZHR 60 meteors/hour, velocity 65.5 km/sec'. Predictor programs suggested, for the QF22-QG63 path, a minor peak around 1800Z, a null around 2000Z-2100Z and the major peak between 0000Z and 0200Z.

Note: To avoid confusion with UTC dates and times, all following dates and times are AEST.

I started monitoring the VK3RGL beacon on 144.530 MHz on Wednesday, 2nd May and managed to work VK3HY at 1105. On Thursday at 0859, I worked VK3HY and VK3XQ on the same burn. Friday morning I worked VK3HY at 0932 and again at 0950 on two good burns.

Saturday morning had lots of FSK441 activity and many were reporting super long burns - one up to 180 seconds long around 0700. I worked on SSB VK3HY, VK3AMZ, VK3BBB and VK3DUT several times during the morning.

Sunday morning was possibly the best time because there were many stations on. Many long, loud burns from 0800 right through to 1100.

Monday morning was another very good day with long burns occurring from 0530 right through to 1220. One burn was over 120 seconds with VK3AMZ and another allowing us to complete a two way CW QSO. I was very happy with that QSO!

Tuesday morning, the shower was noticeably weaker and only VK3AMZ active but still a few good burns.

Wednesday morning - shower over.

General observations. I thought the predictions were quite accurate. The peak seemed to be Sunday morning (that's Saturday, UTC time). The QF22-QG63 path of 1420 km is ideal for 144MHz meteor scatter. The common window for two, well equipped stations is very large so the footprint for these burns is vast. I have worked Sydney stations off meteors that produce a burn for VK3RGL. VK3RGL is using 7.5 watts to a 7 dBd Yagi pointed up this way and is a fantastic meteor scatter beacon. VK3AMZ was using Channel 5a Newcastle as a beacon and it is a very reliable indicator for a burn on the QF22-QG63 path, even though I am almost 700 km north of Channel 5a. Any average ham station of '100 watts to a Yagi' should be able to participate in this exciting mode.

Next decent Meteor showers suitable for 144MHz SSB are:

- Orionids: October 21 (disappointing last year).
- Leonids: November 17 (unreliable but every 33 years fantastic. Next big event, 2030).
- Geminids: December 14. Very reliable.

Catch a falling star!

Gavin VK3HY submitted the following regarding his experience from the southern end of the VK4-VK3 path:

144MHz SSB QSOs from VK3HY during Eta Aquarids meteor shower, May 2012.

			Sent	Rcvd
2nd May	0105Z	VK4OX	5x2	5x5
	2258Z	VK4OX	5x7	5x5
	2350Z	VK4OX	5x3	5x5
3rd May	2332Z	VK4OX	5x5	5x7
	2350Z	VK4OX	5x7	5x5
4th May	2105Z	VK4OX	5x7	5x9
	2105Z	VK4VDX	5x7	5x7
	2106Z	VK4NWH	5x5	5x7
5th May	1937Z	VK4OX	5x5	5x5
	2022Z	VK4OX	5x2	5x5
	2031Z	VK4OX	5x6	5x7
	2036Z	VK4OX	5x7	5x7
	2253Z	VK4OX	5x2	5x4

Stations heard but not worked on 5th May: VK2KOL VK4NE VK4JMC.

There were many contacts made by others in VK2, VK3 and VK4 with plenty of burns of sufficient length for complete SSB QSOs.

There was lots of listening to 'white noise' in between the pings and burns but plenty of rewards for those who persevered.

Arie VK3AMZ was busy at the southern end of the path. He reports: *The Eta Aquarids meteor shower delivered a mixed result but certainly meteor scatter conditions were much enhanced due to their presence over the weekend of 4th and 5th of May. I principally concentrated on completing two-way SSB QSOs on 2 metres. One technique that I adopted from Adrian VK4OX was to monitor a signal for a meteor ping - in this case Channel 5A Vision carrier on 138.276 MHz, and then call CQ on either 144.1 or 144.2. This technique proved to be quite successful, completing two-way*

SSB contacts with the following stations on the 4th of May: VK4OX, VK2BCC and VK2KOL.

Conditions ramped up on the 5th of May where I completed two-way SSB contacts with the following stations: VK4OX, VK2ZT, VK2BCC, VK2KOL, VK4VDX and VK4JMC. Good meteor scatter conditions continued on the 6th of May where I completed numerous two-way SSB contacts with VK4OX (one ping lasted just over two minutes), VK4VDX, VK4NE and VK4JMC. A very memorable contact on this day was the completion of a two-way CW contact with VK4OX! This I consider quite a rare event and was the result of a very favourable meteor burn. Both of us used hand keyers and relied on the grey matter between our ears to decode the signals (very unusual these days!).

By the 7th of May, meteor scatter conditions had deteriorated but despite this I completed two-way SSB contacts with VK4OX (four times) and VK4JMC.

Meteor showers occur throughout the year and it's worth noting their dates and times to exploit the opportunity of long haul VHF DX.

As Adrian said once (and I agree), 'a five second meteor burn is a waste on FSK441 - it should be used for SSB'.

GippsTech 2012

A late reminder that GippsTech 2012 is just around the corner. This year it is being held over the weekend of 5-7 July. It is an event not to be missed by VHF/UHF/microwave enthusiasts.

Details: ***http://www.vk3bez.org/gippstech_ver1.htm***

Please send any Weak Signal reports to David VK3HZ at *vk3hz@wia.org.au*

FSK441

Welcome to Paul VK2XDX at Wauchope, near Port Macquarie in NSW, who has joined in the weekend activity sessions and has worked down to VK3 and VK7.

Digital DX Modes

Rex Moncur VK7MO

FSK441 VK Procedure

WSJT provides two standard procedures for North America and Europe. In VK we have developed our own procedure that is optimised for the activity sessions and has advantages that it allows one to work more than one station at a time and explicitly identifies the transmitting and receiving stations. The short hand or signal tone messages used in Europe and North America are not used during activity sessions as these are not identified with callsigns and would cause confusion. An example of a QSO with two stations is as follows on the table below.

The messages can be typed by hand into any of the 6 TX message positions on WSJT. Even if you are working only one station there is benefit in using this procedure as it helps others who are monitoring to identify the station transmitting as this station does not have a '/' after the callsign. ZL stations also use this procedure.

Note that after callsigns are exchanged in full both ways it is acceptable to abbreviate the callsign of the station you are working but your own callsign should be sent in full for the benefit of other stations who might wish to call you. It is generally impractical to work more than two stations because of the limitation of WSJT on the number of character that can be transmitted. If you do attempt to transmit a long message check the message actually being transmitted in the bottom right hand corner of the WSJT window in case it is truncated.

Activity sessions are held on Saturday and Sunday mornings as below and all are welcome to participate. Times are local times in VIC/NSW/ACT/TAS. Please see table on next page.

It may seem odd that all stations operate on the same frequency but the above procedure ensures that stations in the same area are transmitting and receiving at the same time and if their computer times are accurately set should not interfere. In general meteor pings from stations in the same area do not overlap as the foot print of a meteor ping on two metres is typically only a few km.

Small Station 10 GHZ EME

Following last month's report of initial tests Alan VK3XPD (three metre [10 ft] dish and 75 watts) completed an EME QSO to Rex VK7MO's small portable station (64 cm dish and eight watts). This work took advantage of a time of low lunar libration (less than 10 Hz) so that JT65c could be used as well as using a program by Glen English VK1XX to automatically tune Rex's

Transmitted by VK7MO	Transmitted by other Stations
CQ VK7MO	
	VK7MO/26 VK4KSY
VK4KSY/R27 VK7MO	
	VK7MO/27 VK1WJ/26 VK4JMC
VK4KSY/R27 VK4JMC/R37 VK7MO	
	7MO/RRR VK1WJ/26 VK4JMC
VK4KSY/R27 4JMC/73 VK7MO	
	VK1WJ/26 VK4JMC
	7MO/RRR VK4KSY
4KSY/73 VK7MO	

Day and Time	Frequency MHz	Stations involved	Stations transmitting first period
Saturday 0600 to 0700	144.330	VK to ZL	ZL
Saturday 0700 to 0800	144.230	VK3/5/7 to VK1/2/4	VK3/5/7
Sunday 0700 to 0800	144.230	VK1/2/3/5/7 to VK4	VK1/2/3/5/7

IC-910-H to correct for Doppler from the moon. While Alan's 75 watts was reliably decoded with libration spreading as wide as 80 Hz Alan had to wait until the libration was below 15 Hz before he could gain sync on Rex's signal – even then he had to use Deep Search averaging over several periods to achieve a decode. A full report of this work is at: *http://www.vk3hz.net/microwave/10-GHz-EME-QSO-with-64-cm.pdf*

Following this work a paper has been prepared on the "Occurrence of low libration spreading" which is available at: *http://www.vk3hz.net/microwave/Low-Libration-EME.pdf*

It was found that libration spreading is best for stations on the same longitude, worst for stations 90 degrees apart in longitude and improves again for stations 180 degrees apart. It also improves for stations nearer the poles than at the equator.

Please send any Digital DX Modes reports to Rex VK7MO at *rmoncur@bigpond.net.au*

WIA Contest Website

To keep up to date with all of the major Australian contests, including rules and results, at the WIA Contest Website at:

www.wia.org.au/members/contests/about

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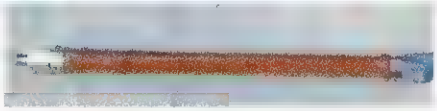

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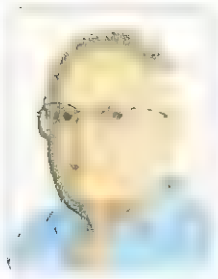

DX-News & Views

John Bazley VK4OQ
e *john.bazley@bigpond.com*

What will probably be defined as the DXpedition of the year, the 7O6T **Yemen** (Socotra Island IOTA AF028) bash has concluded, with many DXers very happy to have worked a new one and, as a bonus, a very rare IOTA, and others saddened because, for any number of reasons, they didn't make it into the log this time around.

The DXpedition achieved around 162,000 QSOs, and worked 187 countries, and it is pleasing to report that quite a few VK/ZLs worked them, on a variety of bands and modes. Indeed, it was great to hear the operators call for 'VK/ZL only' on numerous occasions, leading to about 200 VK/ZLs making it into the log for around a total of 1,000 QSOs; although, significantly, this constitutes less than 1% of the DXpedition's QSO total and illustrates the degree of difficulty VK/ZLs often have working in the big piles.

By the time you read this, the A5A *Bhutan* DXpedition will have concluded and its crew returned to their home QTHs. This proved to be quite a battle for the VK/ZL DXing community – at time of writing, a day or so before they finished their effort, only thirty or so VKs had made it into their log, for not many QSOs. Still, those who did make it will no doubt be very satisfied, as Bhutan has proved a difficult grab from VK/ZL over time.

An intrepid VK DXer has asked me to pass on his request to all **VK9/0** DXpeditions that they make even a modest effort operating SSB mode on 30 metres, which they are allowed to do, but nobody ever seems to try. A well published sked, perhaps issued before the DXpedition gets under way would, surely, attract a few VK DXers for what would, indeed, be one up on the world. And surely take very little operating time away from the broader DXing effort.

Antennas on the shack roof at 7O6T. Photo courtesy of 7O6T.

Eric KV1J will be returning to **Miquelon** and operating as FP/KV1J from July 10 through July 17. He plans to be on QRV on 160-6 metres on SSB, CW, RTTY, PSK31 and Feld Hell. Eric plans to be active in the IARU HF World Championship running about 600 watts. The Motel de Miquelon (Maxotel) has closed indefinitely, so Eric will be operating from a private home that may become a location for future DXpeditions. Eric has a web page at *http://www.kv1j.com/fp/July12.html* QSL via KV1J and LoTW.

V31WH, V31MX and V31MO in **Belize** by W5HNS, K0BCN and W5MRM will be on Cay Caulker, NA-073, from July 23-31. They will be on 40-10 with a five band hexbeam and 40 metre dipole, both CW and SSB. They're still considering digital modes. They will have just one station operational and will be in the IOTA contest July 28-29 with the V31MX callsign, alternating between SSB and CW. QSL on LoTW or to their home calls.

The planned AS-154, Giresun Island expedition has been *cancelled*. Refer *The Daily DX* newsletter (Vol 16, nr 108, 4 Jun), also *DX World*. The reason stated: "The Hungarian operators were refused operating permission by the Turkish authorities".

Oleg UA1PBA/ZS1ANF is now working from the Bellinghausen Base on **King George Island** (AN-010), in the South Shetland Islands. Listen for either RI1ANF or ZS7ANF/A with an emphasis on the low bands (1.8 through 7 MHz). QSL via ZS1ANF or RK1PWA.

Radio Amateurs of Canada (RAC) is anticipating 'public consultation through the Canada Gazette' for VE amateur radio operators to gain authorization on 5 MHz on 'a secondary basis' by summer 2012. RAC's goal 'is to ensure that Canadian amateurs have the 60 metre allocation available to all amateurs as part of their amateur radio certification, that is, without licence applications, licence fees or special call signs'. VE amateur radio operators can acquire a provisional 60 metre authorization by contacting their local Industry Canada Regional Office for less than $100.00. More details can be found at *http://www.rac.ca/en/news/bulletins/2012/21/*

Members of the **Jersey** Amateur Radio Society (GJ3DVC) contest group plan to operate in the RSGB

IOTA contest on July 28-29 as GJ2A. QSL via K2WR (NA) or GJ3DVC (all others) and LoTW.

Ralph VK3FRNB is now on a volunteer assignment in Honiara, **Solomon Islands** for the next two years. He is currently able to operate on 20, 15 and 10 metres and soon hopes to be on 40 metres, as H44RK. As for QSLing Ralph says 'At the moment only eQSL until I organize a mailing address and some QSL cards'.

Tiho HH2/9A7GAE is working at the Red Cross Mission in Leogane, **Haiti** for at least the next five months. He will be QRV on 80, 40, 20, 17, 10 and 6 metres on SSB and the digital modes, in his spare time. QSL via 9A7GAE, and eventually LoTW.

Eric T6MO (K9GY) says 'It's official now' – he will be in **Afghanistan** until April or May of next year. He planned to go to Dayton this year.

Luigi OD5/IV3XNF will be on a UN Interim Force mission in **Lebanon** between May and October. He will be on a military base but plans to operate in his free time. He will have an FT-817ND (QRP) and wire antennas. He prefers CW/digital modes. QSL direct to home call.

7P8 **Lesotho**. Frosty K5LBU stays busy... He says: 'Well there are three of us that are looking at going to Lesotho 7P8 in mid-July this year. Anyone else out there that might like to go? Email me at *frosty1@pdq.net* Schedule will be to arrive in Johannesburg on the morning of 12 July. Drive down to Roma, Lesotho to set up and play being DX till Saturday the 21st. Then go back to Johannesburg on the morning of the 22nd to fly out that evening'.

CG7CWPC, a 'two by four callsign' is a special one from **Canada** for the VE7BAR group from the Burnaby Amateur Radio Club, for the 100th anniversary of the 'C.W. Parker Carousel' at the Burnaby Village Museum. They plan to operate on all HF bands and modes, June 15-July 15. We don't know if there will be Doppler effect if they operate from the moving carousel. QSL direct or via bureau to VE7EES. *www.ve7bar.org/*

A combined Irish and Polish group plans an operation to **Little Saltes**, EU-103, for the RSGB IOTA contest, July 28-29. The operators are EI5JQ, EI7KD, SP9UUC, EI9KC, EI3JZ, EI6KD and SQ7NNM.

Dick AH6EZ and Harry K9DXA plan to be QRV as VY0/AH6EZ and VY0/K9DXA Rankin Inlet (grid locator EP32tw), **Nunavut**, Canada between June 21st and July 2nd, including the ARRL's Field Day. On July 1st they will be QRV in the Radio Canada Contest as VY0RAC. On one day between June 25th and 29th they hope to operate from Marble Island (NA-185) running QRP for a few hours. They will be using a HexBeam and vertical running a kW on seven through 50 MHz on SSB, CW and maybe even some digital modes. The two have a website at *http://ah6ez.yolasite.com* QSL via AH6EZ, K9DXA, or VY0RAC.

V47JA, **St. Kitts and Nevis**, is by W5JON, July 12-August 2. He will be at Calypso Bay on St. Kitts, planning to operate on 80-6 metres and including 60 metres, SSB. QSL via W5JON or LoTW. He plans to be active in the RSGB IOTA contest. W5HAM will also operate, using the V47HAM callsign, occasionally.

MJ/OT9Z on **Jersey Island** is planned for July 20-27. The operators will be ON8ZZ, ON3JA and ON3NT. QSL via the bureau to the OT9Z callsign.

GB1HF is a special event station for the **2012 Olympic Games**, July 27-August 23. This operation is being run by the South Essex Amateur Radio Society. They plan to be on various bands and modes, with an apparent special emphasis on an operation from a cross-country cycling venue. *http://www.southessex-ars.co.uk/olympic2012.html*

Josep A3AKY has joined the D64K team, which plan to be QRV from the **Comoros Islands** in August. Despite it being a 'bad month for F2' he will be QRV on 50 MHz and will do their best 'to work as many stations as possible'. They will also be on six metres EME. 'UKSMG and InnovAntennas are looking to sponsor them with a seven element LFA Yagi' says Peter G3ZSS. More news from D64K is expected in the coming weeks. They have a website at *http://www.d64k.com/*

Special thanks to the authors of *The Daily DX (W3UR), 425 DX News (I1JQJ) and QRZ.DX* for information appearing in this month's DX News & Views. For interested readers you can obtain from W3UR a free two-week trial of The Daily DX from *www.dailydx.com/trial.htm*

Participate

July 14 **Maryborough Electronics and Radio Group Inc Hamfest**

July 21 **Gippsland Gate Radio & Electronics Club Annual Hamfest Sale**

July 29 **AWARC Hamfest Albury Wodonga Amateur Radio Club**

The Icom ID-31A 70 cm handheld transceiver

Peter Freeman VK3PF, with Michael Carey VK5ZEA

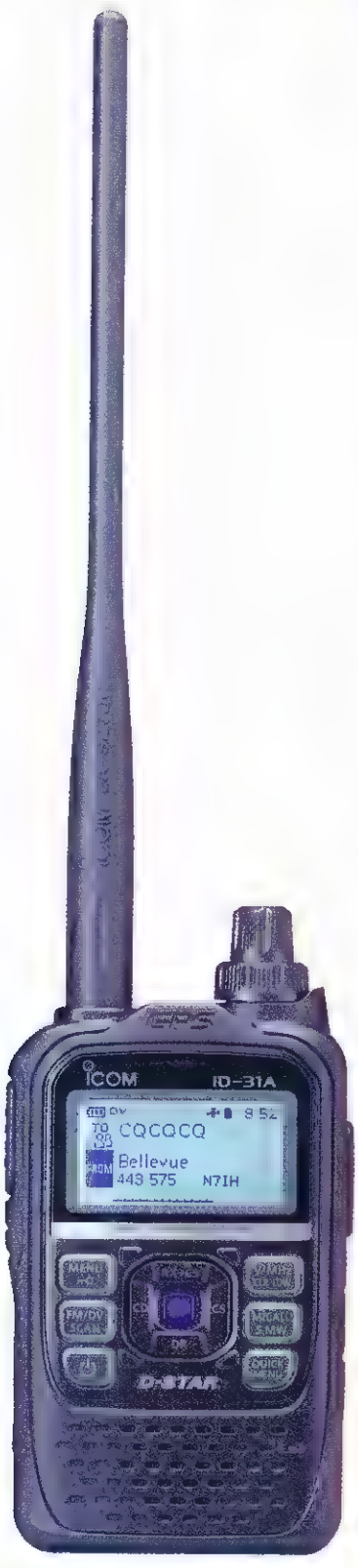

Photo 1: The ID-31A 70 cm hand held.

Earlier this year, Icom Australia released a new 70 cm handheld transceiver – the ID-31A. As one might expect from the deviation from the usual model identification prefix (ID instead of the usual IC), the new radio includes digital capability in the form of D-STAR built into the transceiver as standard.

In early February, I received an email from Icom which included a press release on the ID-31A together with an offer of the loan of a unit with the view to preparing a review. Naturally, I had to accept. The package arrived a day or two later.

The ID-31A is a five watt 70 cm FM transceiver complete with the D-STAR coder/decoder and GPS. Readers may recall a review of the IC-92AD dual band handheld some time ago: with the IC-92AD, the D-STAR board was an optional extra, as was the handheld microphone which had a built in GPS receiver.

On opening the box, one could note the usual style of packing of a typical handheld transceiver: the main body of the radio, the battery pack, the antenna, a belt clip and a wrist strap, an operating manual, a battery charger and a warranty card. In addition, the ID-31A package included a 'D-STAR Quick Guide', a CD and an envelope marked 'Introductory Offer' which contained a two GB MicroSD memory card. The CD includes an electronic copy of the Instruction Manual, the D-STAR Quick Guide, the Icom booklet 'Ham radio terms', an 'Advanced Instructions' manual and a copy of the CS-31 cloning software with a digital manual for the software.

The transceiver was quickly assembled without the need to refer to the Instruction Manual and was soon in operation on the local 70 cm FM repeater and on simplex. Personally, I found basic operation of the unit extremely simple and intuitive.

It should be noted that we do not have a D-STAR repeater in the Latrobe Valley. As a result, I (VK3PF) shall describe the general features of the transceiver. During discussions with others during the review period, I became aware that Michael VK5ZEA was making good use of an ID-31A on the D-STAR network from Port Lincoln. I dropped an email to Michael and asked him to prepare some comments about the unit with respect to D-STAR usage. His comments will follow mine.

Transceiver features

The ID-31A is a true palm-sized handheld transceiver. Its dimensions are 58 (W)×95 (H)×25.4 (D) mm (not including projections), with a mass of only 225 grams (140 grams without battery pack). According to the Instruction Manual, the key features include:

- 'Built-in GPS receiver
- GPS Logger function allows you to check your route as you move
- MicroSD card slot ready for memory storage
- Voice recorder to record your communication
- Waterproof construction (IPX7 - Only when the BP-271 or BP-272 battery pack, antenna and jack cover are attached.)
- DV mode (Digital voice + Low-speed data communication) operation-ready
- Text message and call sign exchange

- Transmit position data
  DR (D-STAR Repeater) mode and repeater list allow you to easily operate using a D-STAR repeater.'

Unlike many handheld transceivers currently on the market, there is no numeric keypad with multiple functions. Instead, the ID-31A has a full dot-matrix display and a directional keypad which allows for quick access to essential features and commands. Combined with the built in firmware, the combination offers operation that is easy-to-use and understand.

The ID-31A includes 552 standard memory channels, with 50 scan edge memories and two call channels. In addition, there are 700 D-STAR repeater memories, which gives a total of 1,252 memory channels. There are multiple scan functions and CTCSS/DTCS encoding.

The transmitter is specified to cover 420 – 450 MHz for the Australian model, guaranteed to work across the 430 – 450 MHz range. Tuning steps available are 5, 6.25, 10, 12.5, 15, 20, 25, 30, 50, 100, 125 and 200 kHz. The transceiver can cope with external power supplies across the range 10 – 16 V DC. Based on the supplied battery pack (BP-271 – 7.4 V 1200 mAh Li-Ion) at 7.4 V, on transmit at five watts output, the unit will draw a maximum of 2.5 A. Transmit power can be set to one of four levels: High 5.0 W, Mid 2.5 W, Low 0.5 W, S-Low 0.1 W.

The receiver is listed as covering 400 – 479 MHz, again with the 430 – 450 MHz range guaranteed. On receive, the unit draws between 200 and 450 mA, depending upon mode and if it is the internal or an external speaker which is in use. The receiver uses a dual conversion superheterodyne system, with IF frequencies of 46.35 MHz and 450 kHz. Sensitivity is listed as less than -15 dBμ in FM mode and less than -11 dBμ in DV mode. Audio output power is listed as 0.4 W into a 16 ohm load (internal speaker) and 0.2 W into an eight ohm load (external speaker).

In addition to FM and DV modes, the unit will also operate in FM-N (narrow FM) mode.

The antenna connector is an SMA female on the unit, requiring an SMA male on the antenna or a coaxial cable connecting to a remote antenna.

Many optional extras are available, including a variety of battery packs (including AA cells) and chargers, power leads, leather case, headset, speaker/microphones and a level converter if you wish to program the unit direct from a computer. The easiest (and cheapest) option for programming is to copy the inbuilt memory contents to the microSD card installed in the ID-31A,and to then use the supplied CS-31 software to modify the memory contents with the microSD card in the computer.

The microSD card is also used by another feature of the radio – the inbuilt voice recorder. You can record received audio for later replay, audio for later transmission or a voice message to use as a DV auto reply message if you are called in DV mode.

The ID-31A in use

This transceiver is a delight to use. It fits snugly in the hand and its size and mass means that it can realistically be dropped into a shirt pocket. There is no need to clip it to a belt via the belt clip, which is a requirement with many handheld transceivers. It was simple to use the radio without reference to the Instruction Manual for basic FM operations. The manuals are well written and it is easy to find your way through the menu system to change settings.

I received excellent reports on air on FM simplex and via the local repeater. You can read Michael's comments below regarding DV (Digital Voice) and DR (DV Repeater) operations. Audio quality during receive was excellent, with adequate volume from the speaker.

The CS-31 cloning software was simple to use. You do not need a cloning cable if you use a microSD memory card. Be sure to read the manual on installing and formatting the memory card. Beware not to wipe the pre-programmed memory contents! (I accidently clicked a 'Yes' prompt button without having looked at the manual. However, the situation was recoverable.)

The strong point of the ID-31A really is the way it works on the D-STAR system. I had little opportunity to access the D-STAR system during the review period, so over to Michael VK5ZEA to talk about those aspects.

D-STAR – the ID-31A strong point

Michael Carey VK5ZEA

I use my Icom ID-31A D-STAR radio on a daily basis. I am fortunate in that I can play with my ID-31A while at work and this allows me to check into a lot of overseas D-STAR nets around the world. On an average week I check into around 10 D-STAR nets which tend to be conducted in the morning (Australian time).

Operationally the ID-31A is quite different from my previous Icom IC-91AD radio. This is mainly due to the lack of the more familiar numerical/function keypad. All of the numerical/operational buttons on the front of my IC-91AD have two functions...this makes quick access to a lot of functions relatively quick and easy...the ID-31A goes about things a little differently...

Most of the common D-STAR operations can be performed by using the central D-pad in the middle of the control keys. This in conjunction with the Menu and Quick Menu keys makes using the ID-31A in D-STAR mode very intuitive.

One of the main features of the new Icom ID-31A 70 cm handheld radio is its D-STAR capabilities.

Photo 2: The ID-31A 70 cm hand held beside its older cousin, the IC-92AD.

In my opinion, this more than makes up for the fact that the ID-31A is a single band (70 cm) radio in a world where virtually all new handheld radios are a dual band device.

I have been using D-STAR since January 2008. In July 2008 I installed the VK5REX B 70 cm D-STAR repeater in Port Lincoln and I really haven't looked back, I'm a D-STAR-aholic!

The ID-31A incorporates all the familiar D-STAR features of past Icom D-STAR radios and adds a whole heap of new ones!

Probably the most welcome feature addition in the ID-31A is the incorporation of an internal GPS receiver. The sensitivity of the internal GPS is remarkable, although accuracy does suffer if the GPS is inside a building...the better the view of the sky, the more accurate the position.

The GPS receiver has several functions...the first is a no-brainer, it allows you to send your GPS position when you key up in D-STAR mode. One of the features of the D-STAR protocol is that it allows you to send data at the same time as digital voice. This data can take several forms, but GPS data is a common use. When the ID-31A is in GPS-A mode, this position data takes the form of a more familiar APRS position frame. A D-STAR Gateway computer can extract this from the D-STAR data stream and send it off to the APRS-IS system. All previous Icom D-STAR radios had this feature as well, but the ID-31A is the first handheld where the GPS receiver has been integrated into the transceiver.

The ID-31A can also use NMEA data from an external GPS, plus you can manually enter a position. In the GPS mode, there is an option to switch on the GPS to get a fixed position and then turn it off. Great if you are operating stationary portable and don't want the GPS receiver to drain the battery. You can also send NMEA GPS data from the internal receiver out through the serial socket, fantastic for feeding position data to a laptop, APRS tracker or navigation device.

The GPS receiver can also be used to set the ID-31A's internal clock, very handy!

The other novel use of the GPS receiver is to allow the user to easily set up the ID-31A radio to use a nearby D-STAR repeater based on location. If you travel to a new area with a D-STAR repeater, the radio can use the position determined by the GPS to program the repeater frequencies, offset and callsign information automatically. For example, if you hopped off a plane at the Port Lincoln airport, your ID-31A radio could configure itself to use the Port Lincoln VK5REX B D-STAR repeater with four quick button presses. The ID-31A comes pre-programmed with D-STAR repeater information; updated information can be downloaded from the Icom Japan/Global website. This makes it quite easy for a new user to get things going with minimal user programming required. One little criticism is that this function only works with D-STAR repeaters...it would be great if the database could be expanded to include FM repeaters too. Imagine turning your handheld radio in a new city and having it 'find' the closest repeaters and then automatically configure frequencies, offsets and CTCSS tones.

The ID-31A can also log GPS positions to the MicroSD card. The interval at which the positions are recorded can be selected from 1, 5, 10, 30 or 60 seconds. The file that is saved in the MicroSD card consists of the raw NMEA data sentences from the GPS receiver. I've successfully been able to load GPS log files created by the ID-31A into Google Earth. The ID-31A also has a GPS Logger Only mode where all other functions of the radio are turned off, extending the operating time of the GPS logger considerably.

Operationally, the most commonly used D-STAR functions are accessed through the central

D-pad. Each quadrant of the ID-31A D-pad has two functions, a quick press is used to navigate within menus and the central blue button is the OK or Enter key. The secondary functions of the D-pad keys are accessed with a long press. The up key performs the D-STAR RX>CS function where you can review past received D-STAR calls and then set the calling stations D-STAR callsign in the ID-31A's URCall field...great for using the traditional D-STAR repeater callsign routing capability.

A long press of the down key enables the DR (D-STAR Repeater) mode, this makes using the D-STAR callsign routing functions more intuitive and easier than in previous non-DR mode enabled D-STAR radios. In the DR mode you can use the GPS to select your nearest D-STAR repeater and also select the repeater or D-STAR user you want to send your D-STAR call to.

A long press of the left key brings up the received callsign history. This is where you can go back through the last forty received D-STAR calls. Each entry holds a whole heap of information...the callsign of the calling station, the 20 character 'text' message sent along with the transmission, the time the call was received (always accurate with the GPS referenced internal clock), if the received station was transmitting GPS information this too is displayed along with course and speed information, their maidenhead grid is also shown along with a distance to their station from you. This received callsign list is updated with each received call... the newest is at the top of the list.

A long press of the right key brings up the callsign menu. This is where you can change the four D-STAR callsign fields, UR, R1, R2 and MY. The most common one that most users change frequently is the UR or URCall. This is normally set to CQCQCQ but is used to command the Dplus linking system. Dplus is the add-on software that works with the Icom G2 gateway software that enables 'IRLP style' linking.

The ID-31A has 200 URCall memories which is a most welcome increase over the 60 I have in my IC-91AD. The Dplus linking system responds to 'commands' in the URCall field to connect and disconnect links to other gateways or reflectors...the more URCall memories you have, the more commands you can store. The default configuration files that can be downloaded from the Icom Japan/Global website have pre-programmed link commands for Dplus reflectors 001 to 047, each with three modules A, B and C. Dplus has recently been upgraded to include modules D and E. I have modified my memories with links to the Dplus reflectors that I use the most. A little bit of forethought with programming beforehand can make real-world Dplus linking operation of the ID-31A very easy.

The Quick Menu key is context sensitive, when pressed it will bring up options that relate to what you are doing at that time. This is makes using the ID-31A, even without a full keypad, extremely easy.

I find the speech function of the ID-31A an amazing feature. Others have found it annoying; I suppose it is a personal choice. The speech function enables the radio to announce received D-STAR calls by reading out the callsign in either English or Japanese. There are two speech modes; one announces every time a call is received, the other mode is the one I use. Called 'Kerchunk', it only speaks the callsign after a short transmission. On D-STAR, you are identified by your radio each time you transmit. Your callsign is embedded in the data stream and a lot of operators simply quick-key to announce their presence. With other D-STAR radios you would then need to either look at the screen to see who pressed their PTT, or you would need to go through the 'called' menu and review the received call that way. With the ID-31A's speech function, the radio will read this information out for you. Some have complained about the US pronunciation of the 'Z' character...I simply selected the 'phonetic' alphabet and each letter of the callsign is read out in the phonetic alphabet.

There are also tone controls for use with the D-STAR DV mode. The user of the radio can adjust TX bass and treble and RX bass and treble. There is also a RX bass boost function to restore a bit of bottom end to received audio that can be missing at times.

I've found the receive performance of the ID-31A in D-STAR mode to be exceptional. I've not had the opportunity to view a service manual of the ID-31A to see the GMSK modem section to compare to other Icom D-STAR radios...but I expect that lessons learnt from earlier D-STAR radios have been incorporated by Icom into the ID-31A.

Conclusions

The ID-31A is a compact, highly capable and lightweight 70 cm handheld which performs superbly. As supplied, it comes with all the essentials, including a software package which enables one to easily manage the large number of memory channels available. It makes the use of the D-STAR system much easier to use for someone who is new to the system.

It will be interesting to see the next generation D-STAR capable dual band hand held when one is released. The ID-31A with its extensive capabilities gives an interesting glimpse into the direction that Icom is taking with its radio development.

The ID-31A is excellent value for money – they are selling for $399.00 from authorised dealers.

Thank you to Icom Australia for the loan of the unit used by VK3PF.

GippsTech 2012

We will be running an alternate program for partners, with Pauline Corrigan acting as the guide. In addition, there are social gatherings in the form of a Bistro meal on Friday evening and the Conference Dinner on Saturday evening.

Registration including meals close on 30 June. We can accommodate a small number of additional participants after that date, but meals will not be available to late registrants.

The **Annual GippsTech 2012 Conference** is almost here. The conference is hosted by the Eastern Zone Amateur Radio Club (Inc.) and will be held on the weekend of 7 and 8 July 2012 at Monash University Gippsland Campus, Churchill. The technical program is almost finalised, with the following topics offered:

- A local cost GPS frequency reference for any radio
- DVSSB - A PC based digital speech mode that rivals SSB above 30 MHz
- Converting ex Analogue TV equipment for use on the amateur bands
- 24 GHz propagation
- 78 GHz and Up!! An alternative, simple approach to millimetre wave homebrewing
- Stepping in it
- The Marconi Poldhu Station
- 10 GHz rainscatter
- Cheap preamp for 10 GHz
- Microwave power amplifier construction
- DVB-T dongles for amateur SDR
- 5.7 GHz preamp
- New software from VK3UM
- Digital Interface for the IC-706
- Es Backscatter Doppler Shift Measurements Using CW and Chirp Radar Techniques
- Publish your radio projects on the web, in three easy steps
- Long-range ionospheric DX on 6 m and 2 m - new angles on success
- SOTA - a new challenge
- WRC-15 issues for amateurs

More information is available by following the GippsTech links at the Club website: ***http://www.vk3bez.org/***

Silent Key

William A Wells VK4UA

Bill Wells VK4UA became a Silent Key on 30 May, 2012 having turned 89 earlier in May 2012. He came from country Victoria and his interest in radio began as a 14 year old when he built his first radio receiver. Bill served in the RAAF from 1942-46. Licensed for 65 years, first as VK3AWW in November 1947, his first equipment was a 6V6 PA modulated by a pair of 6V6s and he used an ex-military BC348 as a receiver. As a young man he founded and ran his own business manufacturing RF heat sealing equipment.

In 1950 he joined the Department of Civil Aviation and become an airways engineer.

About 1952 he become VK3WL and upgraded his station to a pair of 807s with an 807 modulator in class B. The antenna at this time was a two-element wire beam about six metres high.

In 1963 he was seconded to a position in the USA to investigate the possibility of having underwater sonar equipment being manufactured in Australia.

In 1967 he went to Canada as Technical Manager for EXPO-67 in Montreal. In 1968 he moved to the USA for three years as a Senior Engineer on the Mallard Project. This was an international co-operative research and development between Australia, Canada, United Kingdom and the United States of America of a military communications system. While there he operated as VK3WL/W2 working about 180 countries with a two element quad antenna, a Hallicrafters SR100 and a Heathkit SB2 linear amplifier, which was needed and used because of the high power of the W2 stations.

On returning to Australia in 1970 he lived in Canberra where he was Supervising Engineer of Guided Weapons and Electronics with the Department of Supply, responsible for the design and installation of communications which revolutionised air traffic control Australia wide. His call sign was then VK1WB.

In 1979 he was badly injured in a fall from his tower even though wearing what he thought was a correctly fitted safety belt. He retired a year later and in 1986 moved to Queensland, on to an acreage property where he had a very good take-off for radio communication and was always on the air with the call sign of VK4CWB, which he changed to VK4UA about 1989.

From about 1990 he assisted Percy VK3PA to run the ANZA DX Net where many new entities were worked by those checking in. He told of days when he was acting as net controller and there would be up to 140 check-ins. When this happened they would have to split the net and work on two frequencies and could often be there for two or three hours. Over his operating time he QSLed 376 entities, which included 40 deleted countries. When Percy become a SK in July 1998, Bill VK4UA, Morris ZL1ANF, Tex VK1TX and a group of volunteers got together and drew up a roster of net controllers to keep the ANZA DX net going. One of the memorable DX visitors to the ANZA net was Chuck Brady 3Y0C, who made a solo trip to Bouvet Island in December 2000. Chuck checked in to the ANZA net several times and net controller Bill VK4UA consistently managed to pull his signal out of the mire and assisted many operators to get this rare DX station in their logs.

With his health failing he moved from his acreage location in 2008 and after a short time with his daughter moved into an aged care home where radio was not possible. This really frustrated him but he was, on occasion, able to operate from his daughter's house where a vertical antenna had been erected.

Vale Bill VK4UA.

Contributed by Ray Crawford VK4NH.

A transceiver control and audio interface using USB components

Dale Hughes VK1DSH

It's funny how a combination of circumstances can help recall memories or ideas previously stored away... The events in this case were:

- Annoyance at the apparently poor frequency calibration of the inbuilt sound card in the laptop computer I use for weak-signal digital mode communications.
- Frustration at having too many cables to change over when wanting to use the laptop to operate different transceivers on digital modes.
- Lack of a standard serial port on the laptop which meant always needing a 'USB-to-Serial' converter cable.
- Publication of a USB sound interface project in the June 2011 edition of Silicon Chip magazine (see reference 1).

Out of interest, I acquired the necessary parts for the USB sound interface and was very happy with its performance when it was constructed. Its sample rate (therefore its frequency calibration) was accurate and its signal to noise ratio appeared to be much better that the laptop PC sound interface. Based on these factors, the decision was made to consider using it in place of the laptop sound device, but just using another sound card would mean more cables etc. It seemed like a good idea to combine all the necessary hardware into a single enclosure and look for a way to simplify connection to multiple radios and the laptop PC. That would solve all of the problems!

Then returned the memory of a GippsTech presentation describing a similar device, using all commercially available components. Searching through the conference proceedings of the last few years, I found that the presentation was given by David Smith VK3HZ at GippsTech 2009 (see reference 2). David's presentation described how he combined a USB sound card 'dongle', USB-serial converter and USB hub in a small box which give him a small and portable device for operating his radio from his PC. That now seemed like a very good solution. Of course I could have purchased one of the commercially available units, but that would have spoilt the fun.

So, that is the preamble. Let us get on with the technical stuff. The USB sound interface is based on a PCM2902E CODEC which includes the audio analog-to-digital and digital-to-analog converters and USB 1.1 interface. It also includes a digital audio interface which isn't used for this project. The printed circuit board supplied by Silicon Chip is a double sided board which is well laid out and most of the components, except for the CODEC and low-noise voltage regulator are through-hole devices which makes for simplified construction. The required parts were purchased from Element14 and Jaycar – no kit is available. The unit was assembled and tested in a few hours and it worked first go. Furthermore, the completed unit works significantly better than the on-board audio interface in my laptop PC.

The most important aspect for my use is the accuracy of the ADC sample rate. The PCM2902E supports seven standard sampling rates between 8 and 48 kHz. The sample rate is set by a 12 MHz crystal oscillator which, in principle, can be adjusted to set the oscillator to exactly 12.000 MHz. I modified the original design by using silver-mica capacitors instead of the specified NPO types and the oscillator appears stable and very close to 12.000 MHz without any adjustment. As an aside, access to the CODEC oscillator would allow locking it to an external frequency reference which would be useful for very weak signal work.

Why is the accuracy of the CODEC sample rate so important? It only matters when you are doing some sort of spectral analysis for signal detection and demodulation. For example, it is very common on the 137 kHz band to use very long 'dot lengths' for DX communications, maybe as long as 120 seconds per dot. This is called QRSS120 and it requires a high level of frequency stability for both the receiver and transmitter. Typically, the receive bandwidth is only a few Hz, with the width of the associated FFT-bins being perhaps 10 mHz wide (that's correct, it's milli-Hertz). To put it another way, weak signal work is a lot like looking for a 'needle in a hay stack'. You need be looking in the correct 'hay stack' if you are going to successfully receive a weak signal, hence the need for accurate frequency calibration.

The USB audio device is also used to generate audio signals for the transmitter; therefore frequency stability and accuracy are just as important. As the frequency of the audio signal generated by the CODEC DAC is mostly determined by the sample rate, it needs to be accurately defined to ensure you are transmitting in the right 'hay stack' (frequency).

As published, the Silicon Chip USB audio interface also includes microphone input channels which may or may not be useful depending upon your application. I included them in my unit, but all radio related audio input-output is at

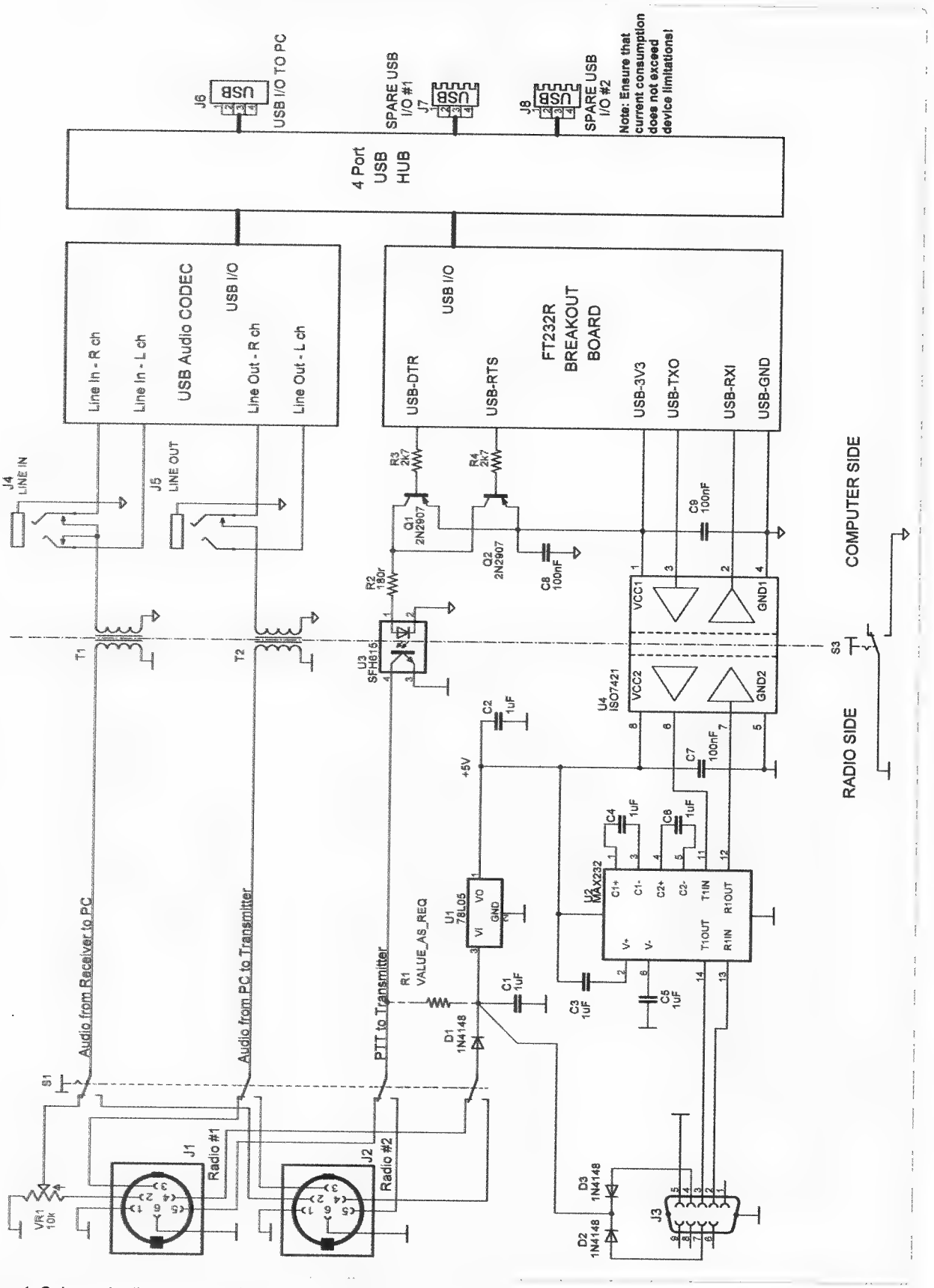

Figure 1: Schematic diagram of USB-transceiver interface.

'line level' so the microphone inputs are not strictly necessary. Audio from the radio(s) is fed to both right and left channels of the CODEC, but this can be changed if required. Audio out from the CODEC uses the right channel alone, but again this can be changed to suit the particular need of the user.

My experience (see reference 3 for more details) has been that 'galvanic' isolation between the radio and computer equipment is very useful in eliminating the last vestiges of computer noise from the receiver. Galvanic isolation means that there is no direct, or copper, signal connection between the devices. Suitable isolation techniques generally use magnetic or optical coupling, although capacitive coupling may be suitable in some situations as you will shortly see. The schematic diagram shows two earth symbols and these are physically and electrically separate earths which help to maintain the isolation between the radio and computer. However it is useful to be able to link the earths for testing, or where noise is not an issue, and a switch is provided which connects the two earths together (S3 on the schematic diagram).

To achieve the audio isolation I used two 600:600 ohm audio transformers (Altronics M1000 or similar) and mounted the radio connections on an insulated plate which isolates the earth connection between the attached radios and computer. Note that in any case, the radio should be connected to a proper radio earth and that the computer should be connected to the mains earth for safety reasons. From a noise reduction point of view it is generally better to a have a separate radio earth built around a number of independent earth rods driven into the ground. In the unlikely event you are using the system in an aircraft you will have to adopt other measures for proper earthing...

The other important part of the interface is the control circuitry

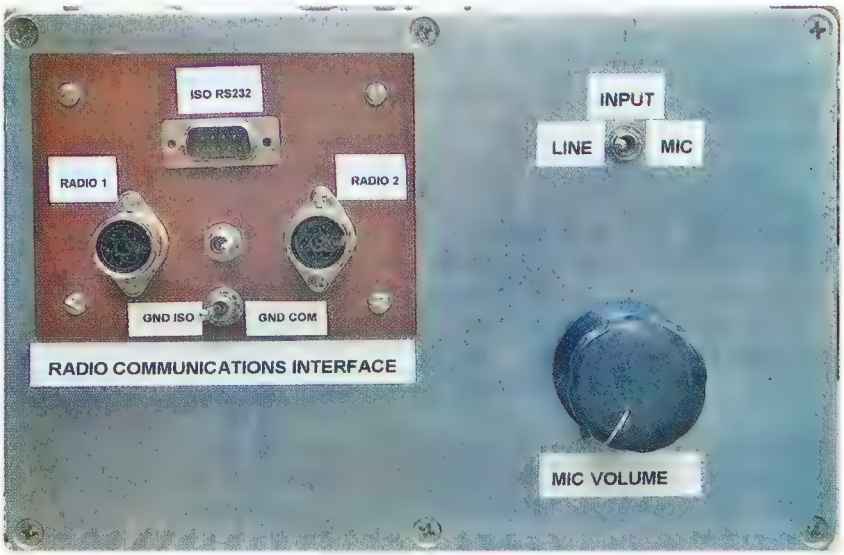

Figure 2: The completed interface. All connections to the radio(s) are mounted on an insulated panel which isolates the radio earth path from the computer earth.

which uses a USB-to-serial converter module. The module contains the all necessary circuitry and firmware to provide a virtual serial port which can be used to send and receive serial data and handshaking information just like a physical serial port on a computer. The module was obtained from Protogear (see *http://www.protogear.com.au/breakout-board-for-ft232rl-usb-to-serial.html*) *(Ed: See OTY page 53 regarding this supplier).* It is a small module which is inexpensive and easy to use; however the converter circuitry doesn't provide any galvanic isolation from the computer, or components to convert the logic levels on the USB serial interface to RS232 voltage levels.

Conversion to/from RS232 levels is easily accomplished using the well-known MAX232 device (U2). This chip contains the 'charge pumps' to generate the required positive and negative voltages; it also contains the RS232 transmitters and receivers. Galvanic isolation of the serial input/output is provided by an ISO7421 chip (U4) from Texas Instruments. This device is a clever unit which uses capacitive coupling to isolate its inputs and outputs. Separate supply voltages and independent earths ensure the isolation. However the isolation comes at a price: power for the RS232 converter and isolator must be supplied from the radio side, but this can be provided either through several unused handshaking lines on the serial port or through a supply feed from the radio. A three-terminal regulator (U1) reduces the voltage to 5 V as required for U2 and U4. An alternative would be to use an isolated DC-DC converter which could derive power from the USB connection, but that wasn't implemented in the current version.

'Press-to-talk' control of the transceiver is isolated via a low-current optical isolator (U3) which is driven via a couple of PNP transistors connected to the RTS and DTR lines from the USB serial converter module. Generally the communications application software will allow you to select a suitable handshaking line for use as the PTT line for transmitter control. When the handshake line is asserted the output transistor of the optical isolator will conduct, pulling its collector terminal to ground. Note that a 'pull-up' resistor may be required in some instances for the PTT to work properly.

The final part of the circuit is a USB-hub which connects the computer to the various USB devices in the interface. I used an inexpensive four-port device. After the printed circuit board was carefully removed from its plastic case, the hub PCB was mounted onto a small piece of blank PCB material so that the assembly could be screwed into the die-cast box along with the audio and serial interfaces. The two spare ports were mounted so that they were accessible from outside the box as this allows other USB devices to be connected if required. Connections between the USB audio interface and USB hub was made by a short length of twisted pair wire that was soldered onto the USB audio board and USB hub PCB. A first attempt at removing the miniature USB connector from the USB serial converter resulted in a damaged board as the tracks are very thin, so another board was used and connection made with a cable that had miniature USB connectors at one end, the other end being soldered to the USB hub PCB.

The USB hub that I used supports the USB 2.0 specification and the USB serial converter supports both the USB 1.1 / USB 2.0 full-speed physical interface; however the PCM2902 CODEC only supports the USB 1.1 standard, but still runs at a bus speed of 12 MHz. I have experienced no problems with this situation and the CODEC works fine through the hub and with all application software that I have tried. An updated PCM2902B part is available which supports the USB 2.0 standard and the rest of the device specifications are virtually identical to the original part, so it would appear that upgrading to USB 2.0 for all USB components is possible. I have not yet tried to do so.

Power for both the USB audio and USB serial circuitry (excluding the RS232 level conversion) is provided by the USB connection from the computer via the USB hub. This is convenient as it means that no additional power supplies are needed and this simplifies application of the device. The only thing to consider is that no more than 500 mA can be supplied by the USB connection from the PC. While the power consumption of the unit is well below this limit, the user will have to make sure that any additional USB devices that are connected to the hub do not draw excessive current.

Connections to and from the radios are made through a pair of 5-pin DIN connectors and a switch (S1 on the schematic diagram) allows selection of the operational radio. A similar arrangement could be applied to the RS232 port, but this was not needed for my application. The line level audio input and outputs are made available through 6.5 mm chassis sockets with inbuilt switching as this increases flexibility of the unit by making it easier to access the audio input/output ports for other applications.

Depending upon the type of radio used, there may be some need to adjust the audio input level to the USB audio interface. Some radios have a fixed audio output level which cannot be adjusted at the radio, for example, the FT-817, in which case it is necessary to be able to adjust the audio level to avoid overdriving the CODEC. The schematic diagram shows a potentiometer (VR1) on one of the radio inputs which can be used to adjust the input level and the same circuitry can be fitted to the other input if required, or can be deleted if the output level from the radio can be controlled at the radio.

When the unit is complete and first connected to your computer, the operating system (Windows XP in my case) will search for and install the appropriate drivers for the sound and serial interface. I experienced no difficulty with this and everything worked first go; however the Silicon Ship article does describe the process in great detail and the article should be consulted if a unit is constructed.

There is one point worth noting for convenience. If possible always use the same USB port when connecting the unit to your PC as the COM port enumeration will stay

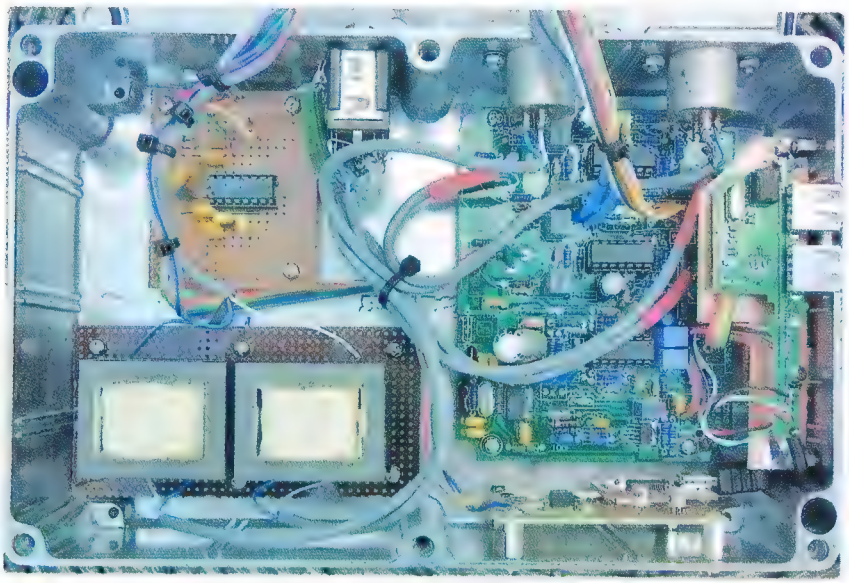

Figure 3: Inside construction and layout of the interface. The USB hub and sound interface are on the right hand side; below that on the bottom right is the USB serial interface and isolators. The RS232 level converter is built on a small piece of 'Vero' board which is just above the audio isolation transformers. The line and microphone sockets can be seen at the top of the box.

the same. If you use a different USB port, the COM port may be assigned to another number which will mean having to change the settings in your application software.

The unit has proven to be flexible and easy to use; the ability to easily switch between multiple radios is very convenient. The performance of the USB sound interface is very good and is substantially better than the inbuilt computer sound card. A further advantage of an external unit is that it reduces the possibility of damage to your computer if something goes wrong with the radio or interface. It is all too easy to overload the audio input of the PC sound interface and permanently damage it. Using an external device means that the damage should be confined to components that are relatively easy to repair.

My thanks go to Bill Maxwell VK7MX for his helpful comments and suggestions about this article.

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1. USB Stereo Recording & Playback Interface. Jim Rowe. Silicon Chip, June, 2011.
2. USB Rig Interface. David Smith VK3HZ. Proceedings from the Twelfth Annual Gippsland Technical Conference, 11/12 July, 2009.
3. PC RFI reduction and sound-card interface. Dale Hughes VK1DSH, Amateur Radio. July, 2009, Volume 77, No 7.

Over to you

An isolated USB interface for controlling radio equipment
AR June 2012, p 60.

I have been advised by a reader of *AR* that Protogear, the supplier of the FT232R board that was used in the June article "An isolated USB interface for controlling radio equiment" is going out of business. I have located another supplier - Australian Robotics - *http://australianrobotics.com.au* - who can supply the breakout boards. This problem will also affect builders of the upcoming article about the isolated sound card interface (published in this issue of *AR*, Ed.).

The ISO7421 device also appears to be difficult to source, so if there is sufficient reader interest I would be prepared to purchase a tube of the devices (75 units) and distribute them at cost.

Dale Hughes VK1DSH

Dale can be contacted via email at: *dalevk1dsh@gmail.com*

Silent Key

Walter (Wally) Giles-Clark VK5TW

It is with sadness that I tell you of the passing of my OM, Walter Edward Giles-Clark, born on 27 November 1929 and died 16 May 2012 from leukaemia.

Wal got into electrics which lead to electronics through his next door neighbour John Stewart (later VK5ZJS) who was an auto electrician. Wal's parents organised a table in his room and he experimented with crystal sets and one day he let out a scream when he heard something and his Mother came running thinking he had electrocuted himself! Wal's Dad gave him a shed to build things in and he built amplifiers and got into mechanics. Wal went through school and experimented with mate Geoff Taylor VK5TY (SK). This included experimentation with light beam communications using audio amplifiers across the backyards at Black Forest in the 1940s.

Both Geoff and Wal started work in the Adelaide Electric Supply Company on an electric training scheme and Wal ended up specialising in underground fault location and 44.5 years later retired from the Electricity Trust of South Australia (ETSA). Whilst District Electrical Inspector at Gumeracha, Wal studied for his amateur ticket at the Marconi school in Adelaide and passed his theory and became VK5ZEH. He

went on and did the black and white TV course at the Marconi school and built a TV just in time for the moon landing. Wal struck up life-long friendships with many people in the district including Eric Jamieson who he convinced to get his amateur licence, which he did, becoming VK5LP. The 'magic band' six metres was all the rage and Eric and Wal were mad keen experimenters.

When Wal went to ETSA - Adelaide Area he was back working with his school mate – Geoff Taylor VK5TY and Geoff convinced him to do his Morse tests. Six tries later the Radio Inspector accused him of using the examinations as practice sessions! He did eventually pass his Morse and put in for VK5TT because he was a mad keen motorcyclist. He was allocated VK5TW – 'Tangled Whiskers' and he always thought it was conspiracy!

Wal was very involved with the Southern Australian branch of the Wireless Institute of Australia and helped refurbish the old Burley Griffin Incinerator into the club rooms and transmitters. He edited the club newsletter for a period as well. The Wireless Institute journal was Gestetner copied and assembled in various amateurs homes and posted out and this was always a very social gathering.

Wal got back into amateur radio in the 1990s and joined the Adelaide Hills Amateur Radio Society when they were meeting at Blackwood High School, along with joining the VK QRP club and enjoyed helping with their magazine - Lo-Key.

Wife Colleen and Wally travelled all over Australia in their Kombis and both were very appreciative of all involved in the VK Traveller's Net, and Wal would always make a page of contacts in the Remembrance Day contest to remember those fallen in WWII.

See you mate – we'll really miss you.

Contributed by Justin Giles-Clark VK7TW.

VK2 news

Tim Mills VK2ZTM
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The next bi-monthly Trash & Treasure conducted by ARNSW will be on the last Sunday this month, 29th July, at the VK2WI site. As well in the morning there will be assessments for all licence grades. The Home Brew and Experimenters group meet in the early afternoon. On the previous Sunday, the 22nd, there will be a one day Foundation course. Information about these events is contained in the weekly VK2WI Sunday news bulletins or it can be found on the ARNSW web site *www.arnsw.org.au* Email contact for courses is *education@arnsw.org.au* or a message to the office telephone 02 9651 1490. Candidates for assessments need to bring with them a head and shoulders passport sized photo, identification and money for the assessments being undertaken.

Equipment upgrade at VK2WI has enabled callbacks to again be taken on the 20 metre service which is to be found on 14.170 MHz. Callbacks on all frequencies from VK2WI are most welcome via the session after the bulletin or can be sent by email to *callbacks@arnsw.org.au*

With other VK2 clubs this month, the Hunter Radio Group has a Ladies night on Thursday the 5th. The Waverley ARS have their annual auction on Saturday, 7th July at their Rose Bay clubrooms. This is a week earlier than that advised in last month's notes. They held their AGM in late May and have a Foundation weekend scheduled for the 8th and 9th September. The Paddington repeater 147.025 now requires a 91.5 CTCSS access tone. WICEN NSW have the annual Bush Walkers Search and Rescue NavShield exercise over the weekend of the 7th and 8th.

The Illawarra ARS are settling into their new meeting location at the Figtree RSL Bowling Club, 120 The Avenue, Figtree, on the second Wednesday evening. Part of the arrangement is for IARS members to join the Bowling Club. The IARS, like many clubs, are finding the cost of operating repeaters is not helped by the tax imposed by the NSW State Government when systems are located on Crown Land sites. IARS operate many sites and are considering moving off some sites where this 'tax' applies. They are in the process of developing a new repeater within the Jervis Bay territory. Once Jervis Bay is established, the Mount Boyne VK2RBT 146.975 will be decommissioned and relocated to a yet to be determined site south of Batemans Bay. A CTCSS tone is to be fitted to the VK2RPM Maddens Plains 146.850 repeater due to the high intermods at the commercial site. It is then planned to add the VK2RRR repeater on trial at Razorback Range to the coast link network, advises IARS Secretary Ross VK2VVV.

St. George ARS have been able to make antenna improvements to their Heathcote VK2RLE on 6800. Also, their Mt. Bindo 6650 has had the VK2WI broadcast linking restored.

HADARC held their AGM in late May with almost the same committee line up from last year. The President is again John VK2ZOI who has stated it will definitely be his last year. HADARC will be taking part in this year's International Lighthouse and Lightship Weekend and have secured access to the Lightship Carpentaria which is moored adjacent the Maritime Museum at Darling Harbour. This is one of four Lightships that Australia built in 1917. These Lightships worked in pairs – one on station and the other in port under maintenance. They were changed over annually. Most of the time one was located off Sandy Cape at the northern tip of Fraser Island, Queensland and the other in the western approaches to Torres Strait. HADARC members will operate alongside Carpentaria across both days on 18th and 19th August.

The Albury Wodonga ARC will have their annual Hamfest on Sunday, 29 July at the Lavington Scout Hall in Mutsch Street. Contact Peter VK2ZZA: *p_burg@tpg.com.au* The Snowy Mountains ARC is a small club covering the Monaro, Snowy Mountains and south coast region. They had their AGM in early May with a committee of Bill VK2ZZF as President, Fred VK2FJS Secretary/Treasurer and Richard VK2HRM as Technical Officer. Besides two metre repeaters their six metre unit on 53.575 is now operational. They are looking into repeater coverage in the west of the Snowys. The club has a Saturday night net on 147.025 MHz.

The Blue Mountains ARC now has a new club house in Moore Street, Glenbrook. At their recent AGM Richard VK2BO was elected President with Kevin VK2ERP as Vice President; Alf VK2YAC is Secretary and Carl VK2HRC is Treasurer. On Committee are Rick VK2FRMC, Michael VK2MJB and Erik VK2EJH. Other positions have Bob VK2AOR as Net manager,

Andrew VK2XPT Web manager, Daniel VK2DC Ragchew Editor, Tony VK2HO Repeater manager, Erik VK2EJH Publicity officer, Steven VK2BOS IRLP manager and Richard VK2BO Education. Carl Harford VK2HRC was given the honour of being elected as a Life Member of the club. Later in the year they plan to hold Winterfest.

Last month the Oxley Region ARC held their annual two day field day on the long weekend. The venue was again the Tacking Point Surf Lifesaving Club Hall. The Saturday night dinner was held at the Port Macquarie Golf Club. A report is in the bi-monthly Oxtales newsletter which can be found at *www.orarc.org* The Fishers Ghost ARC celebrated their 30th year of activities last month with a special event callsign VI2FG30. Check them out at *www.fgarc.net*

Spotlight on **SWLing**

Robin L Harwood VK7RH
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Winter has certainly arrived here and also the carbon tax! My electricity has already jumped $22 a fortnight and Tasmania is supposed to have no coal-fired power. Yes we do have an undersea cable linked to the mainland to share power between us and the rest of Australia. I guess others are also grumpy about the effect that the carbon tax is having on the cost of living!

The 27th of this month sees the commencement of the London Olympics, which will go on to the 12th of August. As it is in the UK and the BBC have host broadcasting rights, we may have some shortwave coverage on their limited HF output. However as in previous Olympiads, most internet streams will go dark because they do not have rights to stream the Olympics. I, along with millions, will be glued to the television anyway and will not have time to listen on radio. I do expect that the local ABC will again have extensive coverage on radio which will be better than the Nine coverage with endless commercials.

I believe that there was a very short-lived clandestine station in May. It was supposed to be sympathetic to the Tamils who either fled from the recent civil war in Sri Lanka or are still in hiding. I personally did not observe it but reports say it first appeared on the unusual frequency of 12250, possibly from central Asia. A few days later it appeared on 12225 yet the programming was western music without any announcements. It was a mystery for a few days until one night a brief ID as the Sri Lanka Broadcasting Corporation was heard in English. It was on 11940 also and it now looks likely that the government in Colombo used the Tricomallee site, formerly used for Deutsche Welle to jam the clandestine signal. Some even speculate that the clandestine never had a chance against the 250 kW sender.

Radio Canada International (RCI) did indeed close down on the 26th of June, despite the protests of staff and loyal listeners. The future of the Sackville site is very much in limbo. I believe that several major international broadcasters had agreement to utilise Sackville and it is unclear at the moment if they too have lost out. Also Radio Netherlands ceased broadcasting in Dutch on the 10/11th of May. The remaining languages will cease at the end of October. It is so sad to witness the decline of shortwave broadcasting in such a rapid and undignified manner.

Papua New Guinea is extremely unstable at the moment with political turmoil swirling about Port Moresby. There are elections apparently scheduled for July in an effort to sort out the mess. The main 100 kW senders are no longer in use yet the provincial stations on the 90 metre tropical allocation are still operational. Also the PNG service of Radio Australia is a reliable source of news for the region. RA is heard in local languages at 0900 on 6020 and 9705, both from Shepparton. Incidentally this instability has spilled over to Vanuatu and the Solomon Islands, both of who are also on shortwave. Vanuatu is on 3945 and 7260, although the latter channel is drowned out by international stations. It is best heard around 0730. Solomon Islands are heard on 5019.9, signing off at 1100. On Sunday night, they have a hymn singing program usually in local languages.

Well that is all for now. Stay warm and keep monitoring.

AMSAT

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2012 – The first six months

The main news from the first half of 2012 has been covered in previous columns: FO-29 was brought back, VO-52 went silent and its second transponder activated, COMPASS-1 went silent and the launch of the Vega rocket. All satellites listed below have been heard by me during the months of April and May except UO-11, NO-44, SO-67, FO-69 and FO-70.

Six-monthly review of operational OSCARs

Here is an updated review of the operational OSCARs and other satellites using amateur satellite service bands. The names of the satellites are given as OSCAR number, full name and (NASA catalogue number). Modes are represented by frequency bands: H=10 m, V=2 m, U=70 cm, L=23 cm, in order of uplink/downlink.

Linear transponders use CW and SSB. With the exception of AO-7's V/H transponder, all linear transponders are 'inverting' types and use LSB for the uplink and USB on the downlink. For AO-7 mode V/H use USB for both links. Most of the activity is in the middle of the passband. If manually adjusting for Doppler then the most compensation should be done with the highest band in use. Foundation licensees are permitted to transmit SSB/CW and FM voice to any of the satellites in the 10 m, 2 m and 70 cm bands as well as receive all the satellites. Foundation licensees are not permitted to use 23 cm uplinks (for example CO-65). See the AMSAT column in September 2009 *AR* for more details.

Telemetry decoding programs for several satellites are available from Mike Rupprecht's website at *http://www.dk3wn.info/software.shtml* Reports of selected satellites heard by amateurs during the past six day can be found at *http://oscar.dcarr.org* (especially useful for AO-7).

AO-7 AMSAT OSCAR 7 (7530)

Launched: 15/11/1974.
Status: Operational only when it is in sunlight. It may be in any mode. During non-eclipse periods as it is currently, AO-7 will alternate between modes V/H and U/V every 24 hours. Beacons are not always on.
Mode: V/H (old mode 'A'), linear, non-inverting.
Uplink: 145.850-145.950 MHz, Downlink: 29.400-29.500 MHz.
Beacon: 29.502 MHz CW. Occasionally the 435.106 MHz CW or RTTY beacon may be on.
Mode: U/V (old mode 'B'), linear, inverting.
Uplink: 432.125-432.175 MHz, Downlink: 145.975-145.925 MHz.
Beacon: 145.972 MHz CW at 10 or 20 WPM.

UO-11 UOSAT-2 (14781)

Launched: 1/3/1984.
Status: Intermittent. UO-11's 145.826 MHz beacon will only work when in full sunlight. You may hear its distinctive signal while monitoring the frequency for other satellites such as ISS, NO-44 and FO-70.
Beacon: 145.826 MHz FM 1k2 AFSK.
http://www.g3cwv.co.uk/oscar11.htm

IO-26 ITAMSAT (22826)

Launched: 26/09/1993.
Status: Semi-operational. IO-26 is in Master Boot Loader (MBL) mode. It transmits continuous BPSK carrier with the occasional telemetry packet.
Beacon: 435.790 MHz 1k2 BPSK (Note: this has shifted from the original published frequency)
http://www.amsat.dk/oz7sat/tlm/view.php?sat=io26

FO-29 FUJI-OSCAR 29 JAS-2 (24278)

Launched: 17/8/1996.
Status: Semi-operational as linear transponder. Most activity is around 435.850 MHz. The BBS and digipeater operation have not been used since 2003.
Mode: V/U linear, inverting.
Uplink: 145.900-146.000 MHz, Downlink 435.900-435.800 MHz.
Beacon: 435.795 MHz CW telemetry.
http://www.ne.jp/asahi/hamradio/je9pel/index.htm
http://tinyurl.com/FO29Blog

NO-44 PCSAT (26931)

Launched: 30/9/2001.
Status: Operational only in full sunlight. One solar panel and the batteries are not functioning.
Mode: V/V 1k2 AFSK packet digipeater.
Uplink: 145.827 MHz, Downlink 145.827 MHz.
http://pcsat.aprs.org

SO-50 SAUDISAT-1C (27607)

Launched: 20/12/2002.
Status: Operational. SO-50 has a sensitive receiver and a transmit power of only 250 mW.
Mode: V/U FM voice with 67 Hz CTCSS tone.
Uplink: 145.850 MHz, Downlink 436.795 MHz (but may switch to 436.790 MHz).

To switch the transmitter on you need to send a few seconds of 74.4 Hz CTCSS tone.

The order of operation is thus (allow for Doppler as necessary):

1) Transmit on 145.850 MHz with a tone of 74.4 Hz to arm the 10 minute timer on board the spacecraft.
2) Now transmit on 145.850 MHz FM voice using a 67 Hz CTCSS tone to access the transponder.

3) Sending the 74.4 Hz tone again within the 10 minute window will reset the timer.

VO-52 HAMSAT (28650)

Launched: 5/5/2005

Status: Operational. VO-52 has two linear transponders that use nearly the same passbands. The Dutch transponder has been in use since March 2012. Its beacon is very strong and an 'image' can be heard in the transponder downlink. Most activity is around 145.900 MHz. AMSAT-India have requested that FM is not used through either transponder.

Mode: U/V linear inverting.

Indian transponder:

Uplink: 435.220-435.280 MHz, Downlink 145.930-145.870 MHz.

Beacon: 145.936 MHz continuous carrier.

Dutch transponder:

Uplink: 435.225-435.275 MHz, Downlink 145.925-145.875 MHz (up to +/-5 kHz variation).

Beacon: 145.862 MHz CW 12 WPM preset message.

http://www.amsatindia.org

The following are mainly Cubesats. Reception reports are often well received and can result in a QSL card for your efforts. See websites for details.

CO-55 CUTE-1 (27844)

Launched: 30/6/2003.

Status: Operational. From the first cubesat launch CO-55 continues to send CW telemetry though the beacon now has an additional carrier.

Beacon: 436.8375 MHz CW telemetry.

http://lss.mes.titech.ac.jp/ssp/cubesat/index_e.html

CO-57 Xi-IV (27848)

Launched: 30/6/2003.

Status: Operational. From the first cubesat launch, CO-57 continues to send CW telemetry. It also has an on-board camera. Pictures of the Earth can be found on the website below.

Beacon: 436.8475 MHz CW telemetry.

http://www.space.t.u-tokyo.ac.jp/gs/en/index.aspx

CO-58 Xi-V (28895)

Launched: 27/10/2005.

Status: Operational. CO-58 has an on-board camera. Pictures of the Earth can be found on the website below.

Beacon: 437.465 MHz CW telemetry.

http://www.space.t.u-tokyo.ac.jp/gs/en/index.aspx

DO-64 Delfi-C3 (32789)

Launched: 28/4/2008.

Status: Semi-operational. The linear transponder has failed. The control team switched DO-64 back to science mode on 29/1/2009. Often by the time it has reached VK/ZL the transmitter has stopped, so it will be heard here occasionally. If they change it to basic mode then the telemetry will be heard over VK/ZL on most passes. The telemetry can be demodulated and decoded using software from the Delfi website.

Beacon: 145.870 MHz (primary) or 145.930 MHz (secondary) 1k2 BPSK telemetry.

http://www.delfic3.nl/index.php

CO-65 CUTE-1.7+APDII (32785)

Launched: 28/4/2008.

Status: Operational. The CW beacon is on continuously. The mode L/U APRS digipeater has been activated during weekends using 9k6 GMSK modulation. Unproto via JQ1YTC.

Mode: L/U 9k6 GMSK.

Uplink: 1267.602 MHz, Downlink 437.475 MHz.

Beacon: 437.275 MHz CW telemetry.

http://lss.mes.titech.ac.jp/ssp/cute1.7/index_e.html

CO-66 SEEDS II (32791)

Launched: 28/4/2008.

Status: Operational. CO-66 is a cubesat that transmits CW telemetry, packet telemetry and a pre-recorded message of voice and SSTV. Sometimes all three can be heard during a pass over VK/ZL as it changes modes. At 450 mW output, CO-66 has one of the strongest signal of any cubesat.

Beacon: 437.385 MHz CW telemetry, 1k2 AFSK packet and FM Digitalker/SSTV.

http://cubesat.aero.cst.nihon-u.ac.jp/english/main_e.html

SO-67 SumbandilaSat (35870)

Launched: 17/9/2009.

Status: Non-Operational. SO-67 has had many problems and the main mission is considered finished. The amateur payload is still functional but there is a problem with the power controllers. Recovery efforts are still continuing. Keep an eye on the AMSAT-SA website at *http://www.amsatsa.org.za/* for the latest news.

Mode: V/U FM voice.

Uplink: 145.875 MHz with 233.6 Hz CTCSS, Downlink 435.345 MHz.

HO-68 XW-1 CAMSAT (36122)

Launched: 15/12/2009.

Status: Semi-operational. A faulty antenna relay is stopping use of the transponders but the beacon is operating continuously. The website has also gone offline.

Beacon: 435.790 MHz CW telemetry.

FO-69 FASTRAC 1 (37227)

Launched: 20/11/2010.

Known as 'Sara Lily.' FO-69 and FO-70 are a dual system to explore inter-satellite communications. APRS packet experiments have been successful using the 145.825 MHz uplink at 1200 baud.

Mode V/U FM PACKET.

Uplink: 145.980 MHz 1k2 AFSK, 145.825 MHz 9k6, Downlink: 435.345 MHz.

FO-70 FASTRAC 2 (37380)

Launched: 20/11/2010.

Known as 'Emma'.

Mode U/V FM PACKET.

Uplink: 435.025 MHz 1k2 AFSK, 437.345 MHz 9k6, Downlink: 145.825 MHz.

http://fastrac.ae.utexas.edu/our_project/overview.php

AO-71 AUBIESAT-1 (37854)

Launched: 28/10/2011.

AUBIESAT-1 is a cubesat from the Auburn University of Alabama. Its mission experiments are radio wave propagation and protective films for solar panels.

Downlink: 437.475 MHz 20 wpm CW for 20 seconds every minute or 75 seconds every five minutes.

http://www.space.auburn.edu/index.htm

MO-72 MaSat-1 (38081)

Launched: 13/2/2012 (part of the Vega launch).

Status: Operational. MO-72 was built by the Budapest University in Hungary. Its mission is student design of various subsystems. It has taken some stunning photos of the southern hemisphere. Telemetry decoding software is available on the website. MO-72 is very popular among the amateurs who want to try working with satellite telemetry.

Downlink: 437.345 MHz CW and GFSK.

http://cubesat.bme.hu/en/

RS-series satellites

RS-15 RADIO ROSTO (23439)

Launched: 26/12/1994.

Status: intermittent. The beacon only comes on when satellite is in full sunlight, and is not on every pass.

Beacon: 29.352 MHz on/off carrier.

RS-30 YUBILEINY (32953)

Launched: 23/5/2008.

Status: Operational. Only the CW beacon has been heard over VK/ZL. Other transmission types are heard when it is in range of the control stations in Russia.

Beacon: 435.315 MHz (primary), 435.215 MHz (secondary) CW telemetry.
http://www.dk3wn.info/sat/afu/sat_rs30.shtml

Other satellites using amateur frequencies

ISS (25544)

Launched: 20/11/1998.
Status: Operational. The International Space Station has an amateur radio station that operates in many modes. Ultimately it depends on the manned crew's activities. Voice, digital, and SSTV modes are used. Sometimes experimental modes are tried; one example was a 23 cm FM repeater uplink on 1269.650 MHz.
Mode: U/V crossband FM repeater.
Uplink: 437.800 MHz FM, Downlink 145.800 MHz.
Mode: V/V Digital / APRS 1k2 AFSK FM.
Uplink: 145.825 MHz, Downlink: 145.825 MHz.
Mode: V/V FM Voice, SSTV.
Uplink: (Region 1) 145.200 MHz, (Region 2/3) 144.490 MHz, Downlink: 145.800 MHz.
http://www.issfanclub.com/
http://www.rac.ca/ariss/

STARS (33498)

Launched: 23/1/2009.
Status: Operational. STARS is two satellites tethered together. Both 'Mother' and 'Daughter' have CW and 1k2 AFSK packet telemetry on 70 cm. The CW beacon of 'Mother' is on continuously, but 'Daughter' is weaker and intermittent.
Beacon: Mother 437.485 MHz, Daughter 437.465 MHz FM 1k2 AFSK.
Beacon: Mother 437.305 MHz, Daughter: 437.273 MHz CW telemetry.
http://stars1.eng.kagawa-u.ac.jp/english/index.html

PRISM (33493)

Launched: 23/1/2009.
Status: Operational. Following from the success of CO-57 and CO-58, the University of Tokyo built PRISM to carry a larger camera with a telephoto lens. The packet downlink is only available over the command stations in Japan, though the CW beacon is on world-wide. PRISM also has an uplink channel but frequency and modulation details have not been published yet. A test was made for amateurs during May 2011 but no news since.
Mode: -/U 1k2 AFSK or 9k6 GMSK.
Downlink: 437.425 MHz.
Beacon: 437.250 MHz CW telemetry.
http://www.space.t.u-tokyo.ac.jp/prism/en/main.html

KKS-1 (33499)

Launched: 23/1/2009.
Status: Operational. KKS-1 transmits a series of messages on its CW beacon.
Beacon: 437.385 MHz CW message.
http://www.kouku-k.ac.jp/~kks-1/kks-gs-top-e.htm

SWISSCUBE (35932)

Launched: 23/9/2009.
Status: Operational. Transmits CW telemetry with frames every 30 seconds. Decoding software is available at their website. SWISSCUBE's mission had ended and will now be under control of two amateur stations in Europe.
Beacon: 437.505 MHz CW telemetry.
http://swisscube.epfl.ch

ITUpSAT (35935)

Launched: 23/9/2009.
Status: Operational. This Turkish cubesat transmits a frame of CW every three minutes giving its name and callsign.
Beacon: 437.325 MHz CW message.

TIsat-1 (36799)

Launched: 12/7/2010.
Status: Operational. TIsat-1 is the first Swiss student-built satellite. Its mission is to test various materials exposed to atomic oxygen at low Earth orbit.
Downlink: 145.980 MHz FM FSK, CW.
Beacon: 437.305 MHz CW at varying speeds.
http://www.spacelab.dti.supsi.ch/tiSat1MS.php

SRMSAT (37841)

Launched: 12/10/2011.
Status: Operational. SRMSAT is a 10kg nanosatellite built by SRM University in India. Its mission is to monitor greenhouse gasses.
Downlink: 437.425 MHz CW telemetry.
http://srmsat.in

RAX-2

Launched: 28/10/11.
Status: Operational. The Radio Aurora Explorer was built by students of the University of Michigan. Its mission is to find irregularities in the ionosphere using ground based radar – which it has done. Its downlink is bursts of data using 9k6 GMSK at 20 second intervals.
Downlink: 437.345 MHz 9k6 GMSK.
http://rax.engin.umich.edu/

HRBE and MCUBED (37855)

Launched: 28/10/2011.
Status: Operational. The Hiscock Radiation Belt Explorer (formally known as E1P, Explorer one prime) is a cubesat developed at the University of Montana. Its mission is to measure the lower Van Allen radiation belt similar to the original Explorer One. HRBE has a strong signal and should be easy to decode. It is joined to M-CUBED from the University of Michigan. M-CUBED's mission is to photograph the earth but has been unsuccessful so far. The satellites didn't separate after launch.
MCUBED Downlink: 437.480 MHz 9k6 FSK.
HRBE Downlink: 437.501 MHz 1200 baud AFSK (use SSB not FM).
http://ssel.montana.edu/e1p/
http://www.pe0sat.vgnet.nl/satellite/cube-nano-picosats/e1p/
http://www.umcubed.org/

Xatcobeo-1 (38082)

Launched: 13/2/2102 (part of the Vega launch).
Xatcobeo is a cubesat from the University of Vigo in Spain is demonstrating a software defined radio and measuring ionising radiation.
Downlink: 437.365 MHz CW (use FM to receive, 75 seconds between frames), 1k2 FFSK.
http://www.xatcobeo.com/cms/

HORYU-II (38340)

Launched: 21/5/2012.
Status: Operational. Horyu-II will investigate high voltage generation issues with solar panels. The CW beacon is on worldwide, the 1k2 packet downlink is used over Japan.
Downlink: 437.345 MHz 20 WPM CW telemetry and 1k2 AFSK.
http://kitsat.ele.kyutech.ac.jp/index_e_new.html

Final pass

There are plenty to choose from. I have heard (and occasionally been part of) QSOs on all the satellites with working transponders. MO-72 has been popular with telemetry gatherers, partly due to the universal ground station software.

AMSAT-VK

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email coordinator@amsat-vk.org

Group Moderator
Judy Williams VK2TJU
email secretary@amsat-vk.org

Website
www.amsat-vk.org

Group site:
group.amsat-vk.org

About AMSAT-VK

AMSAT-VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial Amateur Radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station, Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft.
AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

AMSAT-VK monthly net
Australian National Satellite net

The net takes place on the second Tuesday of each month at 8.30 pm eastern time, that is 0930 Z or 1030 Z depending on daylight saving. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

In New South Wales
VK2RMP Maddens Plains repeater:146.850 MHz
VK2RIS Saddleback repeater: 146.975 MHz
VK2RBT Mt Boyne Repeater on 146.675 MHz

In Queensland
VK4RIL Laidley repeater on 147.700 MHz
VK4RRC Redcliffe 146.925 MHz IRLP node 6404, EchoLink node 44666

In South Australia
VK5TRM, Loxton on 147.125 MHz
VK5RSC, Mt Terrible on 439.825 MHz IRLP node 6278, Echolink node 399996

In Tasmania
VK7RTV Gawler 6 m. Repeater 53.775 MHz IRLP node 6124
VK7RTV Gawler 2 m. Repeater 146.775 MHz. IRLP node 6616

In the Northern Territory
VK8MA Katherine 146.700 MHz FM

Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT-NA or VK3JED conferences. The net is also available via IRLP reflector number 9558. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and nodes can change without much notice. Details are put on the AMSAT-VK group site.

Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night.
Should you wish to join AMSAT-VK, details are available on the web site or sign-up at our group site as above. Membership is free and you will be made very welcome.

Silent Key

Mitchell Edward Hamilton VK5AZM

Mitch was born in 1954 where, at the age of nine, there started an interest in electronics and communications. While a high school student he built several VHF receivers and a 100 watt 50 MHz SSB transmitter. He began a radio and TV trades apprenticeship through Radio Rentals, as well as TV and sound equipment through Kilkenny Technical College. Places of employment in the industry included Farmer's Radio, CFS and Taxi Radios, Car Audio Services (Sydney), Standard Telephone and Cables and the SA Police Department.

As a keen and prolific builder of projects, Mitch originally began designing and building projects for personal needs, where there was a requirement of test equipment for various jobs he was working on.

Although it was sometimes difficult for Mitch to attend club meeting nights, his continued offer of his knowledge and expertise was graciously accepted, particularly in the tuning and repairing of the clubs repeater systems. This totalled numerous hours of personal time and something that SCARC appreciated immensely, although this was always quietly done by Mitch behind the scenes. Mitch was always happy to share his vast amount of knowledge to help those either studying for exams or in upgrading, or trying to understand some item or device obtained by a club member.

Those who remember Mitch can certainly visualise him having a video camera (in some format or another) on his shoulder, recording contests, club functions and anything of interest to him. This was confirmed by the copious amount of tapes at his QTH when the time came to organise his estate.

Mitch will be sorely missed and our thoughts go out to his partner, children and family, who have lost a dearly loved family member. We too have lost an interesting and valuable member of the amateur community and a wonderful member of the SCARC family. The Club has been enriched by his presence and would like to share his contributions to the wider amateur community.

Submitted by Stef Daniels VK5HSX and Barry Bates VK5KBJ, on behalf of the South Coast Amateur Radio Club Inc.

ALARA

Margaret Blight VK3FMAB – Publicity Officer

What a busy autumn we had this year. We not only had the YL International Meet in Adelaide but also the WIA Annual Conference which was held in Mildura only a couple of weeks later. Much planning had gone into the preparation for the YL International Meet, an event which is held on a two yearly basis. ALARA members in South Australia are to be congratulated for hosting and developing a most successful week.

ALARA International Meet 2012

It was noticeable that all the participants were happy to meet and greet both friends and visitors alike and a very friendly environment prevailed. Some of the YLs brought a partner and they also participated in the outings and dinners throughout the week. There was a very comprehensive program planned which certainly kept everyone 'on their toes' as we were taken to visit various sights and experiences. We travelled by bus to such places as Handorf, Cleveland Park Animal Sanctuary and Mt. Lofty on our first day. This offered another opportunity to catch up and chat with the other YLs on the tour.

The following day we gathered at the main venue for an official welcome from Tina VK5TNC the then current President of ALARA. During this period the OMs/ partners went off on their own tour. Sound familiar? We were shown an interesting presentation on SYLRA by Inger OZ7AGR of Denmark. SYLRA is made up of YL members living in five Scandinavian countries, Denmark, Sweden, Iceland, Norway and Finland. They all meet up every two years and the next Meet will be in Denmark on 22-25 August, 2013. For further information look up the SYLRA web page.

Photo 1: YL attendees at the ALARA International Meet in Adelaide, 2012.

Unni LA6RHA from Norway gave an interesting talk about a YL DXpedition to Fair Isle, Britain's most remote island. Situated midway between the Shetland and Orkney islands, while being remote it appears to have very friendly people. There are lots of bird life on the island and each year puffins return to nest. Five YLs participated in the DXpedition which took place in 2010. They successfully made contact with 96 countries. Unni's talk was illustrated by photos taken during their time on the island.

There were visitors from a number of countries attending the Meet. These included three YLs from Japan and one YL from Korea, and representatives from New Zealand, the UK, the USA, Sweden, Denmark, Norway, and Germany. There were also a number of interstate attendees from Queensland, NSW, Victoria and Western Australia.

A visit to Port Adelaide was scheduled for the following day. The bus left us at our destination and we spent an hour or so visiting a local market before boarding The Dolphin Explorer for a cruise on Port River. An excellent lunch was provided during the cruise. We even managed to catch sight of a couple of dolphins who seem to have made their home in the river. On the way home we called into the Railway Museum and enjoyed a ride on a small scale train that runs there.

A very special day was the trip to the Barossa Valley for a progressive meal held at three wineries. We visited Chateau Tanunda, Saltram Wines and Chateau Mildara. At each stop we had a presentation on the winery and its products, and a tasting. The first stop included a cheese and fruit platter, the second included lunch and the third provided most enjoyable sweets and coffee for everyone. I have never had such a good time at a Winery.

In every way the YL International Meet was a great success. We look forward to hearing who will pick up the baton for the next one in 2014.

Photo 2: The international group of YLs attending the Meet.

Photo 3: Door Prize winner, Elfi DF3TE with Meet Organiser and ALARA President, Tina VK5TMC.

BBQ Club social

One sure way to get a group of likeminded people together for a social occasion is to arrange a BBQ. Such an occasion took place at the Goulburn Weir one autumn Sunday afternoon when the Midlands and Shepparton Radio Clubs met for an annual get-together. Five members of the Eastern Mountain District Radio Club also attended. It was a very friendly environment and everyone felt welcome. Despite threatening rain clouds the day proceeded successfully until, as everyone started packing up, the rain finally descended. What good timing, we were able to retreat to our cars and head for home after a most enjoyable day.

I believe that this annual gathering of radio enthusiasts has now occurred four times. It was suggested that in future it may be possible to nominate a location accessible to even more Clubs. Providing an opportunity for clubs to meet up with other amateurs and their partners can only be a good thing. So I look forward to hearing further news on this matter.

VK5 news

There was a large gathering of radio amateurs at Womberoo, near Swan Reach, at Easter. Twelve people

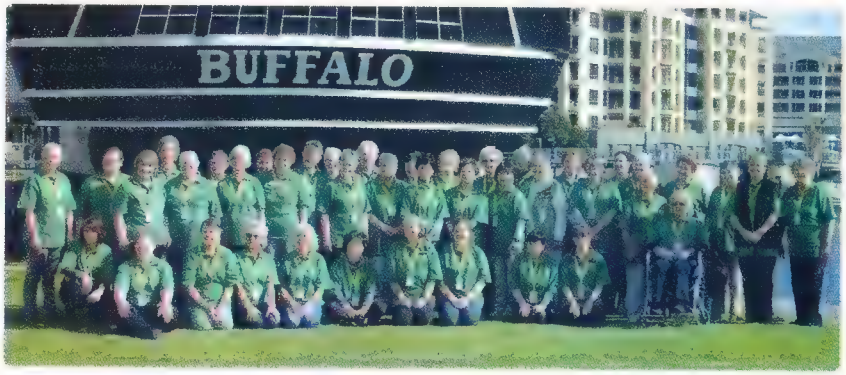


Photo 4: Y/L Group attending taken adjacent to the Buffalo, a replica of the sailing ship which brought the first settlers to South Australia.

slept inside the building while two couples brought up their caravans for sleeping and the group was joined by the next-door-neighbour, as has been the pattern for many years.

Couples took it in turn to prepare meals so no-one had the full responsibility, and each couple made sure there was ample food for everyone. In fact the half a dozen that stayed an extra night enjoyed the left-overs for that meal.

Much talking and a little work was the order of the days and with such a large group it was not difficult to find a different person to speak to from time to time. A little radio was played as several of the mobile units were tested using the large vee-beam that was erected several years ago. Yes several stations in various parts of the world were contacted but the records are in the hands of each of the different operators.

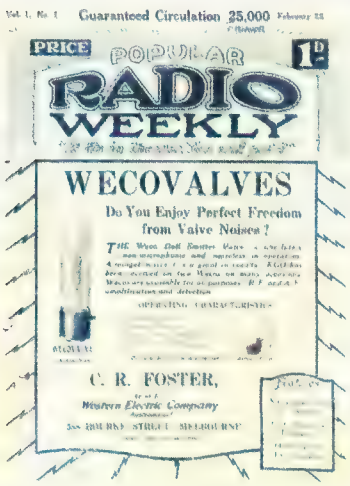
On Monday night the three YLs still there were heard on the ALARA net; just to show that they could.

This year a jigsaw was completed in the weekend. In the past a jigsaw had been started and finished by later visitors. Many hands make light work! Various crafts were worked on and shown.

As a consequence of the 'work' done that weekend, solar-heated hot showers were enjoyed by all but unfortunately a leak was discovered after the showers, caused, we think, by the effort put in to tighten joints, so the solar hot water panels were taken down again before everyone left to go home – to be dismantled and inspected.

Photo 5: Visiting Chateau Yaldara winery in the Barossa Valley.

Hamads



WANTED – NATIONAL

Copies of Radio Weekly magazine

The WIA Archive is seeking copies of Radio Weekly for copying and/or adding to the WIA Archive's shelves.

Little is known about this magazine. The WIA holds two copies only. Volume 1, Number 1 and Volume 2, Number 2. They contain about 36 pages and issues included articles of general radio interest in addition to the odd experimental article.

The magazine was published in Melbourne commencing in February 1925 and claimed a circulation of 25000!

For those who have responded to previous requests for copies of early magazines, thank you. We are gradually building up our collection of important Australian magazines which will be available to future researchers.

Please contact Peter VK3RV via email *vk3rv@wia.org.au* or c/o the National Office in Bayswater if you can help us locate copies of this magazine.

Copies of *Australian CQ* magazine. *See photo at top next column.*

The WIA Archive is seeking early copies of the late 1920s Australian CQ for copying and/or adding to the WIA Archive's shelves.

This magazine was published by the NSW Division of The Australian Radio Transmitters League, a group which was initially formed in 1927 in Queensland and grew quite large in NSW. Later it established itself to some extent in most Australian States. The magazine possibly ceased publication in late 1929 when ARTL members in NSW re-united with the WIA. The WIA Archive holds only one complete copy and one part copy of this magazine. In addition, a small number of copies are held by ARNSW and the Kurrajong Radio Museum. Collectively, we wish to build up the issues extant. The format was fourteen printed pages stapled; each page approximately 150 mm wide x 220 mm height. A coloured cover was included although the colour seems to have changed with each year of publication.

Please contact Peter VK3RV via email *vk3rv@wia.org.au* or c/o the National Office in Bayswater if you can help us locate this important part of our history.

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Mercedes Benz, 1968, white in colour. Completely overhauled new motor four years ago. New shockers, stainless exhaust, velour upholstery, cruise control.

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John VK3PXJ, phone 03 5824 1188

FOR SALE – QLD

One Icom cloning system suitable for Icom T-70A and T-70E. May also suit other Icom radios. Both hardware and software. Brand new, surplus to requirements. Never been used - still in box.

Contact VK4DV by phone (nights) on 07 4928 5537 or email *vk4dv@yahoo.com.au*

FOR SALE - SA

Kenwood TM-D710A 2 m/70 cm, 50 W dual-band, dual in-band receive, 1000 memories, has all the latest features and is an excellent performer. Current model as new in box with all supplied accessories. S/N 90800396. No modifications. The unit is in immaculate condition. Cost me $895, sell for $680 o.n.o.

Contact VK5OO, QTHR. Phone 0412 000 076.

WANTED - SA

Installation instructions for a Scalar SC33DX 10/15/20 metre three element beam antenna.

Contact Steve VK5SFA QTHR, phone 0418 657 658 or *steve_adler@netspace.net.au*

Plan ahead

25 and 26 May, 2013

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More news on the event and preliminary information to help you to begin your planning will be in the August issue of *Amateur Radio*.

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AR is a forum for WIA members' amateur radio experiments, experiences, opinions and news.

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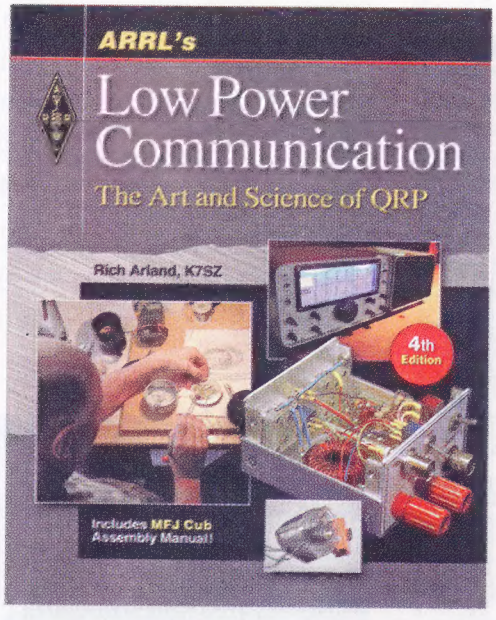

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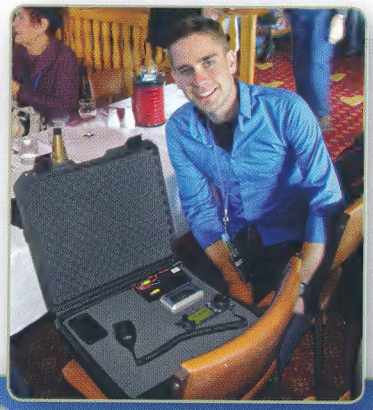
WIA Annual Conference | Mildura 25 - 27 May 2012

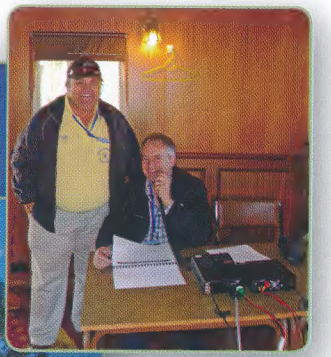
Robert VK3DN, Philip VK3JNI, Michael VK3KI and Noel VK3FI having some radio fun before boarding the Mundoo. Photo courtesy the Sunraysia Daily, photographer David Sickerdick.



Ash VK3SSB with his remote control system for his IC-706MkIIG. Regardless of location, Ash can fire up his home station, provided he has mobile phone coverage.

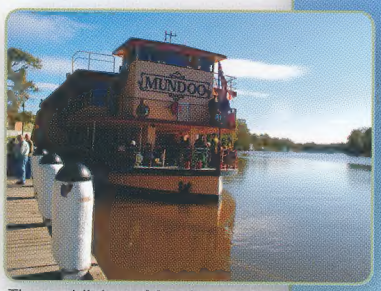
Gary VK3KYF and Noel VK3FI with their mementos presented by Michael VK3KI.

Dale VK1DSH receiving the Ron Wilkinson Award from Michael VK3KI.



Trent VK4TS and Robert VK3DN activating the special event station VK102WIA on the Mundoo.

The Project Horus crew preparing Horus 27 for launch - final filling of the helium balloon.



The paddleboat Mundoo loading prior to the lunch cruise.

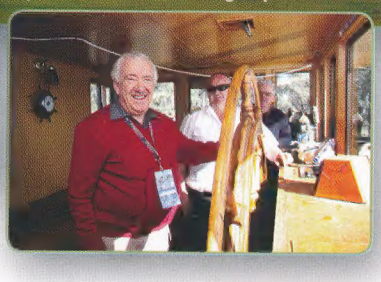
Terry VK5VZI with the camera payload for Horus 27 ready to be added to the payload train.

David VK5KC receiving the Higginbotham Award from President Michael VK3KI.

Main photo: The Horus 27 balloon and payloads in the final stages prior to launch.

Terry VK5VZI preparing the camera payload for Horus 27.

Peter VK3MV is delighted after being presented with the GA Taylor Medal.



Michael VK3KI in control of the Mundoo cruising the Murray River.

Photographs by Dianne Ashton VK3FDIZ, Robert Broomhead VK3DN, Peter Freeman VK3PF and John Longayroux VK3PZ.

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